



**Knowledge Management and its effectiveness for organisational  
transformation through knowledge sharing and transfer**

by

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Submitted in accordance with the requirements for the degree of

**Master of Science**

in the subject of

**Computing**

at the

UNIVERSITY OF SOUTH AFRICA

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**June 2017**

## DECLARATION

I declare that “**Knowledge Management and its effectiveness for organisational transformation through knowledge sharing and transfer**” is my own work and all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.



.....

**Signature**

Alfred Hove Mazorodze

29 December 2017

**Date**

## **ACKNOWLEDGEMENTS**

For advice and ideas rendered to this project, thanks are due to my study supervisor, Professor Sheryl Buckley. She provided generous advice, inspiring guidance and encouragement throughout the 2016/2017 academic year. Most encouraging was her timely feedback and support on critical areas which required expertise. I further extend my gratitude to my co-supervisor, Dr Steven Muragey, who also played a great part in making this research a success. I would also like to thank Mr. Hennie Gerber, a statistician, for calibrating my research instruments in a quantitative manner.

I also thank the following institutions for granting me permission to gather data for my research:

- The University of Namibia's Faculty of Education, Engineering & IT,
- International University of Management,
- Consulting Services Africa,
- Conselect Consulting Engineers and the
- Ongwediva Consulting Engineers.

Thanks are also due to all the participants from the institutions mentioned above who participated in this study. I also would like to thank Dr Liberty Muchativugwa, the language specialist who edited my work. Many thanks are also accorded to individuals who assisted but are not mentioned above: your help went a long way in making this research possible.

## **ABSTRACT**

Knowledge Management aims to improve organisational performance and it marks the beginning of organisational transformation. The two types of knowledge managed are respectively categorised “tacit” and “explicit.” This research investigated the effectiveness of Knowledge Management for organisational transformation in Namibia. It was necessitated by the lack of knowledge sharing among employees and also lack of appropriate tools for effective Knowledge Management. Moreover, some organisations engage in Knowledge Management practices without a full understanding of the processes involved. This was determined by a thorough literature review which indicated that there were very few studies conducted on Knowledge Management in Namibia as shown on Table 1.1 on page 6. The study therefore provided a nuanced understanding of Knowledge Management. The study additionally established that the use of appropriate tools and technologies to better manage the knowledge ultimately improves organisational performance.

The research objectives sought to explore the initiatives deployed to enable knowledge sharing, identify barriers to effective Knowledge Management, analyse the role of social media for knowledge sharing and also measure the effectiveness of the knowledge transfer activities. A mixed method research methodology was used to conduct this investigation. Participants were selected through purposive sampling. Out of 130 questionnaires distributed, 112 were fully completed and returned. This represented an 86.1% response rate. The results of the study revealed that organisational transformation is dependent on effective Knowledge Management. In addition to that, the study found that there is a correlation of 0.6 between Information Technology and Knowledge Management. The study further revealed that initiatives to enable knowledge sharing start with executive support and the employees should be motivated to share knowledge. More so, it was also found that lack of funds for Knowledge Management projects is the greatest barrier in organisations. Effective Knowledge Management is facilitated by social media. Finally, it was found that the most effective knowledge transfer activity is a collaborative virtual workspace followed by Communities of Practice.

**Keywords:** Knowledge, Knowledge Management, Knowledge Management Systems, Information and Communication Technology, knowledge sharing, Communities of Practice, Organisational performance, Organisational transformation.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>CoP</b>	-	Communities of Practice
<b>DIKW</b>	-	Data Information Knowledge Wisdom
<b>DSS</b>	-	Decision Support Systems
<b>HOD</b>	-	Head of Department
<b>ICT</b>	-	Information and Communication Technology
<b>IT</b>	-	Information Technology
<b>IUM</b>	-	International University of Management
<b>KM</b>	-	Knowledge Management
<b>KMC</b>	-	Knowledge Management Cycle
<b>KMO</b>	-	Knowledge Management Officer
<b>KMS</b>	-	Knowledge Management Systems
<b>KPI</b>	-	Key Performance Indicator
<b>SECI</b>	-	Socialisation, Externalisation, Combination, Internalisation
<b>SPSS</b>	-	Statistical Package for Social Sciences
<b>SWOT</b>	-	Strengths, Weaknesses, Opportunities and Threats
<b>TPS</b>	-	Transaction Processing Systems
<b>UNAM</b>	-	University of Namibia
<b>UNISA</b>	-	University of South Africa



## **DEFINITION OF KEY TERMS**

Defining key terms in a study helps to unlock the doors that lead to useful and often technically refined and specific information.

- **Communities of Practice (CoP)**

CoP are formal or informal groups of people who share a common concern or set of problems and they interact, share and expand their expertise and knowledge on that given subject (Wenger, 2014; Heeyoung & lisang, 2014; McDonald & Cater-Steel, 2016).

- **Knowledge**

The nature and tenets of knowledge have been described by Nonaka, Hirata & Toyama (2008), as justified true beliefs. According to Koenig (2012), knowledge refers to the understanding and awareness of phenomena acquired through study, investigation, observation and experience over a period of time.

- **Knowledge Management**

According to Stuhlmann (2012), KM is a conscious and consistent strategy implemented to gather, store and retrieve knowledge and then help distribute such knowledge to those who need it in a timely manner.

- **Organisational performance**

Performance is the end result of an activity, thus organisational performance involves the actual accumulated outputs of an organisation's activities measured against the projected outputs (Burtonshaw-Gunn & Salameh, 2009). Organisational performance cannot be separated from management support because executives must learn, grow and develop with the organisation.

- **Organisational transformation**

Organisational transformation is a planned change where organisations restructure themselves objectively to survive in a competitive environment (Sharma, 2012). Transformation involves re-engineering, re-designing and re-defining business systems which occur in response to changes in context, technology, organisational structure and culture.

# **CHAPTER ONE - INTRODUCTION AND BACKGROUND**

## **1.1 Introduction**

Knowledge Management (KM) in organisations has the principal task of improving organisational performance (Schiama, 2012). KM has developed from a premature concept to an organisational need, especially in this 21<sup>st</sup> century which is highly dependent on technology. According to the Vision 2030 of Namibia (2004), one of the national objectives was to transform Namibia into a knowledge-based, highly-competitive and industrialised nation characterised by sustainable economic growth. This objective could only be achieved if professional skills are transferred from experts to non-experts through KM. Most institutions in Namibia such as government departments, universities and colleges, hospitals and other small and medium enterprises do not exhibit evidence full comprehension of KM. Some of these organisations engage in KM practices without a full understanding that they are actually participating in KM, thereby lacking in organisational efficacy and the effective appropriation of KM into organisational efficiency.

Effective and efficient KM is important in addressing and transforming the manner an organisation operates. This study therefore aimed at providing a better understanding of what KM involves for the ultimate goal of improving organisational efficiency using the appropriate tools, technologies and strategies. Knowledge is shared in efficient organisations by means of various social media platforms, face-to-face meetings and focus group discussions (Wang & Noe, 2010). Technology partially supports KM implementation. KM is a keystone of competitive advantage in today's organisations and, after understanding the value of knowledge itself, it improves the way an organisation is managed. In this respect, KM takes advantage of existing expertise and experiences, enabling organisations to leverage their competencies and stimulating growth (Khedhaouria & Jamal, 2015).

The research explored new methods, tools, technologies and processes that promote the management of knowledge, specifically knowledge sharing and transfer. Moreover, the research identified the initiatives that could be put in place to enable knowledge sharing which could eventually transform an organisation. In addition, the research established and described the barriers to effective KM and underscored the subsequent solutions to overcome these barriers. The study also measured the effectiveness of knowledge transfer activities in organisations, all aimed at improving organisational efficiency which is the major goal of KM.

## **1.2 Statement of the problem**

The rapid advances in Information and Communication Technologies (ICTs) have provided new ways of addressing problems in KM. ICT is considered by many researchers like Song (2007) and Soto-Acosta & Cegarra-Navarro (2016) as a powerful tool for KM success but ICT alone cannot be the ultimate solution. At this moment, ICT is used commendably for data and information processing in organisations, but it has not been appropriated for KM. There are significant challenges encountered and currently ICTs are not fully utilised for KM. Knowledge Management has great potential for organisational transformation in terms of knowledge sharing among employees, but the question remains to what extent this is applied to organisations in Namibia and beyond.

The major source of knowledge in any organisation is its employees who have a wealth of experience in their respective fields. But again, it is the extent to which this resource is tapped into in order to extend the KM capacities of the organisations that matters. Conceding that there are problems associated with knowledge sharing among employees and hence KM is not successfully implemented in most organisations in the developing economies, particularly in Namibia, what progressive steps could be taken in order to overcome such a hurdle? Experts in specialised fields need to be motivated to share what they know with those less endowed. In addition to that, there are numerous KM tools and technologies available today but the problem lies in the selection of appropriate tools that are best suitable for a given organisation. Therefore, there is gap in identifying a globally acceptable methodology for KM implementation that the present study sought to bridge.

It has been empirically proved that many challenges of KM are now non-technical (Paraponaris & Sigal, 2015). Some of the barriers to effective KM involve recognition of KM as a function in an organisation and lack of executive support as analysed by Ujwary-Gil (2011: 94 – 95). Considering all the success factors, tools and technologies, there is still need to explore the extent to which KM improves organisational effectiveness, specifically the provision of metrics to measure such effectiveness in an organisation. Strategies that recognise KM as a separate function are not yet in place in most knowledge-intensive organisations in Namibia and beyond.

### **1.3 Research objectives**

The broad aim of the study clearly states the goals of one's research. As observed by Leedy & Ormrod (2010:3), research requires that one articulates the goal of their study. To Creswell (2009:111), a purpose statement "...sets the objectives and the major idea of a study." This research investigated the effectiveness of KM for organisational transformation. The context of this research were knowledge-intensive organisations (universities and consulting engineering firms) in Namibia. Following on the prescriptions of antecedent research, the objectives in a study are concrete statements describing what a specific study tries to achieve. The study objectives sought to:

- Explore initiatives available that facilitate knowledge sharing and transfer in knowledge-intensive organisations.
- Identify and describe barriers to effective Knowledge Management and the subsequent solutions to overcome these barriers.
- Match the KM tools and technologies with the organisational culture and structures in place, taking into consideration the procedures and policies for KM implementation.
- Determine the connection between Information Technology and Knowledge Management.
- Measure the effectiveness of knowledge transfer activities in organisations so as to promote a knowledge sharing culture among employees.

This study was premised on the understanding that KM is enabled by a combination of technical and social factors such as information technology, organisational culture, structures, people and leadership. The objectives cited above, captured in the active verbs, essentially dovetailed in the formulation of the study's research questions by providing a deep insight into the study domain. Organisational culture and structure are considered as some of the pivotal success factors of KM but there was need to establish how the culture of knowledge sharing could be promoted in the selected organisations.

## **1.4 Research questions**

This study on **Knowledge Management and its effectiveness for organisational transformation through knowledge sharing and transfer** specifically attempted to answer the following major research question since there is consensus among scholars like Girard & Girard (2015); Rouse (2013); and Cesaroni & Consoli (2015) that KM is enabled by a combination of technical and social factors such as information technology, organisational culture, structures, people and leadership:

### **Main research question**

How can Knowledge Management through knowledge sharing and knowledge transfer, contribute to more effective organisational transformation in Namibian knowledge-intensive organisations?

### **Sub-questions**

- a) What does Knowledge Management mean in knowledge-intensive organisations?
- b) What mechanisms can be introduced to enable and facilitate knowledge sharing in knowledge-intensive organisations?
- c) What are the barriers that impact on Knowledge Management (knowledge sharing and knowledge transfer)?
- d) How can people be motivated to improve knowledge sharing and transfer?
- e) How can Knowledge Management tools and technologies (particularly social media tools and technologies) support knowledge sharing and transfer?

These research questions guided the researcher to solve the problem defined. These questions were strategically aligned to the study objectives. In addition, the questions were formulated after a thorough literature review on KM practices and processes. All the questions defined were answered through comprehensive quantitative and qualitative data analysis.

## **1.5 Scope of research**

The research sites in this study were two (2) universities in Namibia and three (3) consulting engineering firms identified. The research established and unpacked the different views of purposefully selected university lecturers and engineers in relation to their conceptualisations of KM. These universities in Namibia are regarded as centres for knowledge creation and graduates from such institutions often find work in consulting engineering firms. The universities studied were state-owned and privately-owned in Namibia. To be specific, the institutions identified and listed below were investigated and visited on a regular basis within the limitations of available resources:

- a) University of Namibia's faculties of Education, Engineering & IT,
- b) The International University of Management,
- c) Consulting Services Africa,
- d) Conselect Consulting Engineers and the
- e) Ongwediva Consulting Engineers.

These institutions were in close proximity to the researcher's duty station. This research did not cover all organisations or sectors because of limited time and financial resources. The scope of study was therefore limited to universities and consulting engineering firms in Namibia only. The ultimate goal of this project was to generate and initiate increased organisational performance with defined metrics. Such an increased organisational performance involves knowledge sharing and innovation as observed by Meihami & Meihami (2014).

## 1.6 Significance and purpose of the study

It is important for any researcher, at whatever level, to demonstrate the importance of the study to different stakeholders and how they are likely to benefit from such study. This research anticipates contributing to scholarly knowledge, enhancing policy developments and also improving knowledge sharing practices. To Creswell (2009: 107) significance of the study serves to explain the importance of the problem to different groups that may benefit from using the study. By incorporating this section, the researcher created a basis for the importance of his study. Creswell (2009), further adds that a viable research problem should, among other concerns, be timely and relate to a practical problem.

With the emergence of KM that is not guided by internationally acceptable standards, the institutions studied benefited from the study results. Results produced provided a better understanding of KM as it applies to their organisations, specifically tertiary institutions and engineering firms. The development of a methodology for implementing KM provided guidance for universities and engineering practitioners in Namibia and beyond. The study was undertaken to encourage and promote a knowledge sharing culture in Namibia.

All universities in Namibia do not teach KM course, as evident in their curriculum specifications, thus there was real need to research and promote the discipline. Most critically, this observation is an indictment in terms of the curriculum specifications of Namibian universities and therefore becomes an exhortation to prescribe KM in the curriculum. This study was the first of its kind to research KM in Namibia and this gap is evident in the literature review segment and the searches undertaken and shown in Table 1.1 below. The table shows the completed and current research in Namibia for the past 10 years according to the searches done on the National Research Foundation of Namibia database and the University of Namibia's institutional repository.

**Table 1.1 Completed and current IT research in Namibia as at 15 April 2017**

2007 – 2017	
Keywords used in search	Namibian Studies, Number of records
Computing AND online learning	151
Information Technology OR Information Systems	35
Emerging Technologies AND Cloud Computing	40
Knowledge Management	18
Knowledge Management AND Organisational transformation	None
Big Data AND Artificial Intelligence	7
Wireless AND Mobile Computing	53

## **1.7 Limitations of the study**

Every practical research is faced with limitations and challenges. This research looked at the effectiveness of KM and its practicality for organisational transformation, specifically knowledge sharing and transfer. This clearly meant that there were people, organisations and the environment involved in the execution and completion of the research task. This study was limited to knowledge-intensive organisations (universities and consulting firms) in Namibia only. Moreover, the research was carried out in an environment which was very busy. The universities' lecturers and other staff were busy with their work schedules of lecturing and administrative work, thus the time to respond to the researcher's questions and involvement was limited and quite constrained. The findings of this study can be generalised to knowledge-intensive organisations in Namibia and other African countries.

## **1.8 Overview of the dissertation**

This dissertation is organised and structured into six (6) chapters:

### **Chapter two: Literature review**

Chapter two of the study focused on the conceptual frameworks. The chapter explained how the study was informed by the chosen conceptual framework and also focused on reviewing literature that is related to the field of KM in organisations. This literature was identified and found in recent journal articles, research papers, presentations and online sources. The literature review comprehensively covered important concepts connected to the research.

### **Chapter three: Research design and methodology**

The third chapter is made up of the research methodology which was followed to complete the research. In this chapter, the researcher further explained and justified the paradigm under which this study falls. The chapter also specified the qualitative and quantitative aspects of the research process. Moreover, the chapter listed and explained the data gathering tools, techniques and instruments used with full justification for their relevance.

### **Chapter four: Data presentation and analysis**

Chapter four consists of data collection, presentation and analysis. The chapter further interpreted the data where the researcher extrapolated patterns, themes and made meaning and sense out of the data gathered.



## **Chapter five: Discussion**

The fifth chapter provided an argument of the findings, with specific reference to the research questions defined. The detailed discussions show how each of the objectives have been met. The chapter also explained the limitations and gaps in the research where the ultimate conclusions were that KM is enabled by a combination of technical and social factors such as information technology, organisational culture, structures, people and leadership.

## **Chapter six: Conclusion and recommendations**

Chapter six consists of conclusions of the study and also made recommendations to the concerned stakeholders. These recommendations were based on the actual findings from a management perspective.

### **1.9 Summary**

The background to the study of KM was highlighted in this chapter. The problem statement was given, clearly explaining the critical areas of KM that need attention. This problem statement was also accompanied by the purpose, objectives and questions of the study that act as the framework and pillars of this research. Furthermore, the significance, justification and scope of the study were highlighted. Key terms associated with this research were also defined. The chapter further provided an insight into the other chapters that constitute the dissertation. The next chapter explains how the study was informed by the chosen conceptual framework and also focuses on reviewing literature that is related to the field of KM in organisations. The literature was drawn from local and international journal articles, research papers, books, conference papers, presentations and online sources. This literature review comprehensively covered all the important concepts connected to the research problem defined.

## **CHAPTER TWO - LITERATURE REVIEW**

### **2. Literature review**

This literature review was carried out taking into consideration the study objectives which sought to find the meaning of KM in an knowledge-intensive organisations. Other objectives sought to identify the challenges of ICTs for KM and also the initiatives that facilitate knowledge sharing in organisations. In addition, other objectives explore the barriers affecting KM implementation and also analysing the tools and technologies which support KM all aimed at improving the organisational effectiveness which eventually leads to organisational transformation. Information Technology (IT) is currently used well for data and information processing in organisations but not for KM. There is a significant gap in knowledge sharing among employees and this review further measures the extent to which this applies in the Namibian/African context. The study also looked at the extent to which the knowledge resource is tapped into in order to extend the capacities of the institutions under investigation. The reasons for conducting a literature review are explained below.

According to Babbie & Mouton (2010), literature review assists the researcher to find how other researchers have examined a similar problem. Multiple sources of information were consulted to reach a deeper understanding of KM. The sources included textbooks, the Internet, local and international journal publications as well as conference papers. Literature review refines the direction of investigation allowing the researcher to actually review what others have done (Leedy & Ormrod, 2010). Reviewing literature also helps to find the different methodologies used by previous scholars, and as such the researcher established relevant methodological directions evident in those applied by different scholars. Babbie & Mouton (2010) further extend that reviewing prior literature is an important feature of any academic research because it creates a firm background for advancing knowledge, specifically in inserting the current study within the matrix of preceding scholarship.

### **2.1 Introduction**

Knowledge Management, specifically in this cyber age, has been in existence for over two decades now. The KM concept was initiated in the 1990s by several theorists who identified the flux in information and knowledge as having changed the way businesses and social institutions work. Knowledge is considered to be an organisation's largest asset which must be managed effectively (O'Dell & Hubert, 2011). KM therefore promises and provides models and tools that help organisations to create an environment which supports knowledge sharing. ICT is currently considered one of the enablers for the effective implementation of KM. Managing knowledge has consequently become an important prospectus aimed at creating value in multi-faceted organisations.

Stuhlmann (2012: 1) describe knowledge as the result of learning. Stuhlmann (2012) further adds that knowledge is a “justified true belief” based on the internalisation of data, information and experience. It is believed that organisational knowledge is entrenched in processes, procedures, individual employees, systems and cultures (Downes & Marchant, 2016). Most theoretical and practical findings in KM are hidden from the public domain because it is normally said that “knowledge is power”, so experts hoard knowledge in order to gain market share. However, other experts share best practices, frameworks and lessons learnt through publication and dissemination of research papers. Research by Rasula et al (2012) has shown that successful KM improves organisational effectiveness, and logically what is left now is measuring the extent to which organisational effectiveness becomes a reality after implementation of KM. Such a quantification of organisational effectiveness is sorely missing in current researches as evident from the empirical evidence from underdeveloped countries by Islam et al (2012).

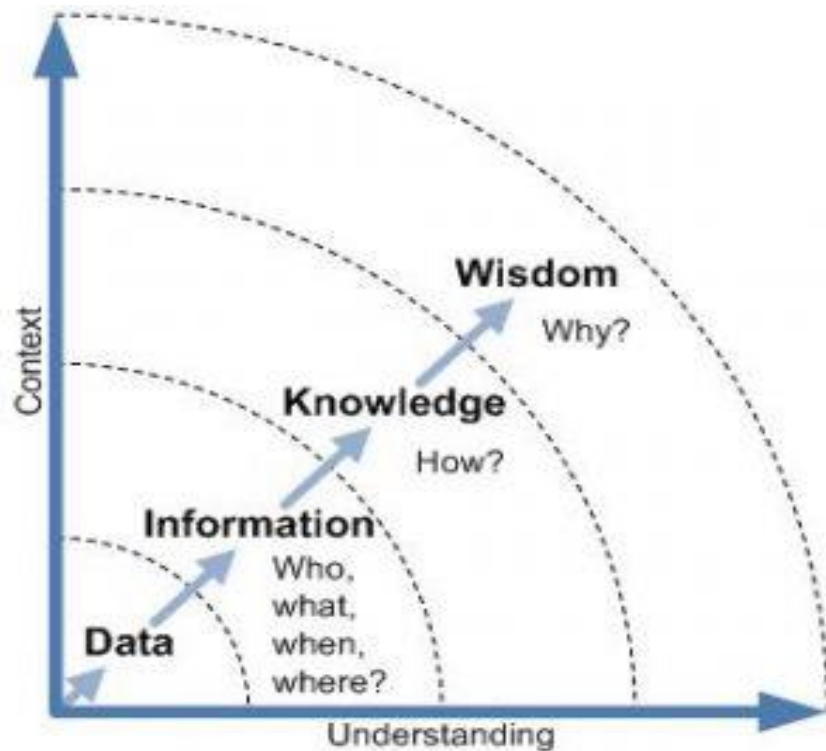
The rise of ICTs has opened new avenues in KM that could meet the challenges linked to knowledge sharing. Knowledge can exist in different media and also in multimodal forms. The major sources of knowledge in any organisation are employees who have a wealth of experience and high technical skills. Knowledge in this respect can be fixed in organisational routines, procedures and structures. It is certain that organisations must conscientiously manage their knowledge, as instruments of differentiation, to boost productivity, leverage competitive advantage and spur innovation. Koenig (2012), Young (2013), Girard & Girard (2015), have all revealed that the role of knowledge in management is value-generation. Having established this point, there is need for empirical evidence regarding which KM tools work efficiently in selected organisations where the purposes are driven to boost productivity, afford competitive advantage and enhance innovation.

Before going deeper into the KM concepts, processes and practices, there is need to describe and discuss the foundations to KM which act as the building blocks to this study. These building blocks address the first objective of this study which sought to synthesize the literature and emerge with an acceptable meaning of KM within knowledge-intensive organisations. This is very important because there are multiple definitions of KM but they all have a common core. For KM to succeed in organisations, individuals need a deep understanding of what constitutes knowledge (Frost, 2014).

## 2.2 The foundations

This study focused on Knowledge Management which has its foundations in data, information and knowledge. The hierarchy, commonly known as the 'Knowledge Hierarchy,' below assists us in accessing background information. The hierarchy known by the abbreviation DIKW (Data, Information, Knowledge, Wisdom) has direct relevance to information systems and KM and could be applied to other disciplines such as computer science (Awad & Ghaziri, 2011).

**Figure 2.1** below shows the DIKW hierarchy.



**Figure 2.1: The DIKW Framework (Howard, 2016: 1)**

### 2.2.1 Data

Badia (2014) defines data as symbols that represent properties of objects, events and their respective environment. He further extends that data is not useful until it is in relevant and usable form. Choo (2013) adds that data on its own has no meaning because it is without context and interpretation. Pearlson & Saunders (2013), describe data as discrete and objective facts which are not organised and processed, and do not have any specific meaning. Howard (2016) therefore advises that the key KM activities include capturing accurate data which can then be transformed into information. It is only when data is standardised, analysed and interpreted according to relationships that it leads to significant and usable information.

### **2.2.2 Information**

According to Pearlson & Saunders (2013), information is contained in descriptions which answer the questions such as who, what, when and how many. In general, information systems generate, store, retrieve and process data. Information is inferred from data and it answers the 'know-what' questions. Information is formatted data which is in many respects a representation of reality (Kent, 2012). Laudon & Laudon (2014) extend this perception and submit that information is data that has been shaped into a form that is meaningful and useful to humans. Together, Badia, Kent and Laudon & Laudon agree that information is data that has been processed and has meanings directed to the intended user. The processes that are associated with the conversion of data into information involve sorting, classification, aggregation, calculation and selection performed by either humans or by information systems or both.

### **2.2.3 Knowledge**

The definition of knowledge is more complex than that of data and information. Knowledge is the know-how that makes possible the transformation of information into instructions (Badia, 2014). Knowledge can be obtained either by transmission from one person who has it, by instruction, or by extraction from experience. The European Framework for Knowledge Management (2015), defines knowledge as the combination of data and information, where expert opinion and experience is added to result in a valued asset which can then be used to improve decision-making. Turban et al. (2009), stress that knowledge is data and/or information that has been processed and organised to convey understanding, experience and expertise as they apply to a current problem. We can therefore conclude that knowledge consists of an aggregation of information, values, rules and experiences from different sources and this observation is also made by Awad & Ghaziri (2011), who describes the process that converts information into knowledge as synthesis of various sources of information over time.

### **2.2.4 Wisdom**

Wisdom is the ability to increase effectiveness and may also provide an insight into questions that do not have a definitive answer (Choo, 2013). Wisdom adds value, which requires the mental function that we call judgment and it answers the 'know-why' questions. According to Awad & Ghaziri (2011), wisdom is the highest level of abstraction based on ethical judgment of an individual's belief. Howard (2016) defines wisdom as the ultimate discernment and application of contextual awareness to provide a common sense of judgment. In most books and journal articles for information systems and KM published locally and internationally, the "wisdom" level of the DIKW is hardly discussed in detail as authors use wisdom to discuss knowledge, information and data.

According to Rowley (2007), the wisdom hierarchy maps different types of information systems as:

Data	Transaction Processing Systems (TPS)
Information	Management Information Systems (MIS)
Knowledge	Decision Support Systems (DSS)
Wisdom	Expert Systems (ES)

Transaction Processing System (TPS) is considered by Turban & Volonino (2011) as the backbone of an organisation's information systems as it collects, stores and processes information for all routine business transactions. Management Information System (MIS) is a planned system of collecting, storing and disseminating information needed to carry out the managerial functions (Laudon & Laudon, 2014). Decision Support System (DSS), on the other hand, is an interactive software-based system intended to help managers in decision-making by accessing large volumes of information produced from various information systems. An expert system is defined by Kopetz (2011) as an interactive computer-based decision tool that uses facts and heuristics to solve difficult decision-making problems based on knowledge acquired from experts.

The "Knowledge Hierarchy" shows and explains that there is more data than information, and more knowledge than wisdom. It becomes quite clear that wisdom is only achieved after much processing of data, information and knowledge. The process starts with data, thus accurate data is very important for an organisation to function and attain its long term goals. Girard (2015) extends that information is defined in terms of data, knowledge in terms of information and wisdom in terms of knowledge. Managing knowledge using the DIKW framework may certainly add value to the organisations studied in Namibia and beyond.

According to Girard & Girard (2015), knowledge resides in the heads of people and it influences organisational success. Understanding that knowledge is a strategic organisational resource, and management is an organisational process involving planning, organising and control, the DIKW framework takes us to a higher level debate regarding the actual meaning of KM as it applies to different organisations.

## 2.3 Definition of Knowledge Management

Several definitions of KM exist in literature, but in general, KM offers a way to capture and store an organisation's knowledge while teams are responsible for the generation of a new architecture of knowledge. All these activities are carried out with the aim of improving organisational effectiveness. KM has evolved from academic theorisations and theories into becoming an essential element of organisational survival and competitiveness (Omotayo, 2015). As a matter of fact, KM has evolved from a concept into a typical organisational need. Some classic and most cited definitions have been reflected upon in this review, but the following submissions facilitate a deeper conceptualisation of the research area into KM as a field.

The pioneers to KM, (Nonaka, Toyama & Hirata, 2008) define KM as:

a process of capturing, developing, sharing and effectively using organisational knowledge.

According to O'Dell & Hubert (2011: 35) KM is

a systematic effort to enable information and knowledge to grow, flow and create value.

Taking cue from the systematic flow of information above, Liu (2016) suggests that KM is:

a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge.

Liu (2016) further stresses that KM focuses on processes such as acquiring, creating and sharing knowledge as well as the cultural and technical foundations that support them. Together, O'Dell & Hubert (2011) and Liu (2016) emphasise the need for systematicity and therefore Dalkir (2011: 27) describes KM as:

the deliberate and systematic coordination of an organisation's people, technology, processes and organisational structures in order to add value through reuse and innovation.

Girard & Girard (2015) define KM as

the process of creating, sharing, using and managing the knowledge and information of an organisation.

Frost (2014) suggests that KM is

the systematic management of an organisation's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements.

From the definitions above, the most common words used are: organising, creating, sharing and managing. Thus, systematicity and coordination run through the definitions submitted. These two are common features in the definitions and conceptualisation of KM. Such a mapping is extended in other scholars such that Bercerra-Fernandez & Sabherwal (2010) concur with Dalkir's view and offer that KM entails:

carrying out activities involved in discovering, capturing, sharing and applying knowledge in terms of resources and people skills, so as to improve the impact of knowledge on the unit's goal realisation.

Lastres (2011: 3) extends this definition of KM as:

the leveraging of the organisation's collective know-how by developing systems and processes to facilitate the identification, capture, dissemination and use of the organisation's knowledge.

In this framing, the imperative lies in meeting the organisation's business objectives, an imperative that appears to have been subsumed in the definitions preceding this submission. Oliva (2014) follows the KM definition identified in Lastres (2011) by noting KM as:

a practice accepted by most organisations looking for efficiency and effectiveness of their administrative processes.

Efficiency of administrative processes is privileged in this definition to the extent that this becomes the prime component of KM. From these definitions by various authors, we can extrapolate that KM centres on organising and availing knowledge to its users as and when required for purposes of making processes systematic and efficient. Koenig (2012) further adds that KM focuses on handling vital knowledge that may reside exclusively in the minds of the organisation's specialists. Generating value from such intellectual assets involves codifying what employees and partners know, and sharing that information among employees in various departments in an effort to devise best practices.



KM is therefore a broad field that spans the fields of “business, economics, management, anthropology, sociology, education and information systems” (Argote & Fahrenkopf, 2016). There is consensus in the literature that KM is a collection of practices associated with the use of knowledge as an important factor to create value for the organisations. Studies conducted so far show that there is still lack of a globally acceptable systematic approach towards KM. It is also evident that KM is implemented differently in disparate organisations, not only in Namibia but elsewhere too. In Information Technology, KM is the process through which businesses create value from their knowledge-based assets and Levinson (2007) confirms this perspective.

Arguably, other definitions of KM are more descriptive in nature and less precise than the ideal in the specific contexts of organisational value-creation and value-addition. The array of definitions offered here highlights the multidisciplinary nature of KM and it is worth noting that many of the definitions are not as specific as some researchers may claim. For this study, the researcher subscribes to the definition of KM by Stuhlmann (2012), which states that:

KM is a conscious and consistent strategy implemented to gather, store and retrieve knowledge and then help distribute the knowledge to those who need it in a timely manner.

It is one definition that apparently encompasses the scope and significant protocols of KM, allowing for both depth and breadth in the conceptualisation of the practice and process. This study established and interrogated the different views of purposefully selected university lecturers and engineers in relation to their conceptualisations of KM. These universities in Namibia are regarded as centres for knowledge creation and graduates from such institutions often find work in engineering consulting firms where KM plays a pivotal role. Knowledge can be created and tested and distinguished from data and information.

Organisations use knowledge for creating strategies for sustainable competitive advantage. Knowledge can also be used for determining an organisation's work processes which is very critical for quality services. Siegel & Shim (2012) add that KM connects people to people and people to information to create a competitive advantage. The following sections therefore discuss KM as it applies to tertiary institutions and engineering firms in general as was described in the scope of this study in chapter 1 that the participants were selected from universities and consulting engineering firms.

### **2.3.1 Knowledge Management in tertiary institutions**

Universities are dynamically changing and they are involved in the knowledge business. According to Ebersberger & Altman (2013), universities face challenges of high expectations from stakeholders, global competition and technological advances. These researchers argue that universities should reflect their visions and strategies for them to be successful and remain competitive in the global environment. Universities' policies, IT governance, culture, leadership and strategic management are important pillars for these institutions to realise their KM goals.

Suciu et al (2013), consider universities as knowledge creation centres which should promote knowledge transfer by making use of appropriate tools and technologies. Effective KM at a tertiary institution ensures the best use of resources available including knowledge itself, which is resident in people, artefacts and organisational entities. The processes that ensure effective KM include creation, capturing, organising and storing knowledge at both individual and organisational level.

This study tries to understand the meaning of KM as it is applied to universities in supporting and ensuring effectiveness of the institutions. Suciu et al (2013) argue that the source of sustainable advantage for universities exists in people's knowledge and skills. Universities produce, transmit and disseminate knowledge. KM in higher education promotes and establishes an innovative and learning culture which results in the development of new concepts as observed by Spridon (2013). These ideas and concepts are developed through research using appropriate technologies.

Hoeborn & Bredtmann (2009) describe mentoring as a fundamental function for KM in higher education. These researchers highlight that the actual task of tertiary institutions is to teach students and do research. They further add that students need to acquire relevant information about the professional sphere and job descriptions. This information can be acquired through mentoring which, according to research, enhances students' chances of success. The Graduate Mentoring Guidebook (2016), extends that mentoring provides professional socialisation and personal support to facilitate success in graduate school. In combination therefore, universities are research sites that nurture a research culture which stimulate this process through robust mentoring. There has been increased pressure arising from globalisation and the need to carve new innovations, essentially meaning that competitiveness has become the order of the day in many research universities.

Universities are complex institutions with different backgrounds, cultures and resources (Taylor & Cranfield, 2008). There are several issues that promote or alternatively hinder KM implementation at tertiary institutions. Universities are facing a more interconnected world where knowledge and innovation are essential elements. Institutions simultaneously face external pressure due to globalisation and the massive production of expert knowledge. In higher education, globalisation encourages universities to think about the most innovative ways they teach, conduct research and manage the institutions (Cranfield & Taylor, 2008). A typical consideration driving KM efforts in higher education includes managing intellectual capital in the workforce.

Persuading employees that it is best to share their knowledge is a real organisational challenge, especially in higher education institutions. Employees believe that they are more powerful than others if they know more. Rick (2009) observed that while employees may not deliberately hoard their knowledge, convincing them to participate in and contribute to a KM system can be a challenge. Depending on the institutional knowledge of individuals, such hoarding can hamper the effectiveness of an organisation. The challenge is to exchange the information that resides in those individuals and make it easily available and accessible to any staff member.

Knowledge sharing practices in universities have taken the form of co-authored articles and research publications. This is quite the trend between supervisor and the Master's or Doctoral students where the joint publications are generated from current research topics and new additional information emerges from such contemporary studies.

KM in higher education contributes to knowledge growth (Nawas & Gomes, 2014). Moreover, KM minimises turnaround time for most interdisciplinary research activities. It has also been found that KM develops human capital and also enhances responsiveness for research scholars. Cranfield & Taylor (2008) advises that institutions of higher learning should concentrate on strategic Knowledge Management and in such a call, universities and university graduates such as engineers cannot escape from the demands of KM.

### **2.3.2 Knowledge Management in Engineering**

In engineering, KM involves development and exploitation of knowledge assets (Milton, 2009). The engineering field is a broad discipline incorporating electrical engineering, civil engineering, structural engineering, telecommunication engineering, mechanical engineering and software engineering. In all these fields, knowledge transfer activities such as coaching and mentoring are very important in transferring knowledge from experienced engineers to non-experienced engineers. KM is also defined in engineering as the process through which an enterprise systematically gathers, organises, analyses and shares knowledge relevant to its operating disciplines (Young, 2013).

The process of KM embraces a wide array of organisational, management and technically orientated approaches that support the exploitation of an organisation's intellectual assets. KM offers significant solutions for different challenges which arise from time to time in engineering departments. Collective knowledge is considered by Charlotte (2010), as experience. Thus, knowledge is an important aspect for any organisation, especially in engineering where there is a long learning curve. The only ingredient of shortening this learning curve is through sharing existing knowledge and experience among staff.

Many engineering firms (civil, electrical, structural, mechanical, software) do not have standard practices of reusing past project experience in estimating time, cost and human resource requirements for their future projects (PMBOK, 2016). The main reasons behind this problem is that:

- There is no proper documentation of previous project experience.
- There is no proper planning based on past experience.
- A culture of sharing experiences is not practised.
- Employees are not aware of who has the expertise within their organisations.

Incorporating engineering firms in this study improves and promotes a knowledge sharing culture in practice. This practice improves the transfer of knowledge to junior staff members which ultimately results in organisations being very effective in their operations. The knowledge transfer activities include mentoring, coaching, storytelling, job rotation, orientation, Communities of Practice and knowledge repositories. According to the Management Mentors (2015), coaching is task-oriented whilst mentoring is relationship-oriented. They further extend that coaching is short term which is performance-driven while mentoring is long term and is development-driven. It is therefore important at this point to define and discuss the different types of knowledge managed in this study.

## 2.4 Types of knowledge

Collins (2010) classifies knowledge into two specific categories: “tacit” and “explicit”. Tacit knowledge, on one hand, is resident in an individual’s mind. Frost (2010) agrees with Collins and adds that tacit knowledge consists of insights, intuitions and hunches. Tacit knowledge is very personal and it is difficult to express and share with others. Tacit knowledge is deeply-rooted in an individual’s experiences, ideals, values and emotions (Collins, 2010). The fundamental feature of tacit knowledge is that it is difficult to articulate in words and communicate by means of a fully articulate and comprehensible language. In a nutshell, tacit knowledge refers to personal expertise.

The fact that tacit knowledge exists and is innate in the individual complicates the distinction with explicit knowledge. The social exposure of the individual to different environments has an incremental effect on the individual’s tacit knowledge. Consequently, this ‘personal expertise’ accrues the more the individual interacts with different technologies and gains perceptible experiences in handling such.

Explicit knowledge, on the other hand, refers to knowledge that can be expressed and explained meaningfully in words and numbers to other audiences. This explicit knowledge can be communicated to other parties and it can be processed by humans or machines so programmed to perform the tasks. This clearly means that explicit knowledge can be shared. Wellman (2009) convincingly argues that for tacit knowledge to be shared it has to be converted into words and numbers that anyone can understand. According to Collins (2010), tacit knowledge acts as a framework for understanding human behaviour in a range of disciplines.

It is vital to understand these two types of knowledge and the mechanisms we engage to manage them. It is difficult to explicate tacit knowledge and then make it accessible for use by others and this is a useful observation that Becerra-Fernandez & Sabherwal (2010) make. In as much as it is essentially critical to explicate tacit knowledge, initiatives for sharing such knowledge should be put in place for every organisation. Tacit knowledge can be transferred through mentorship and coaching (Wellman, 2009). With explicit knowledge, knowledge transfer is done via services and documented processes from which one appropriates the protocols and eventually takes ownership of this explicit knowledge. Table 2.1 on the next page shows the characteristics of the two types of knowledge.

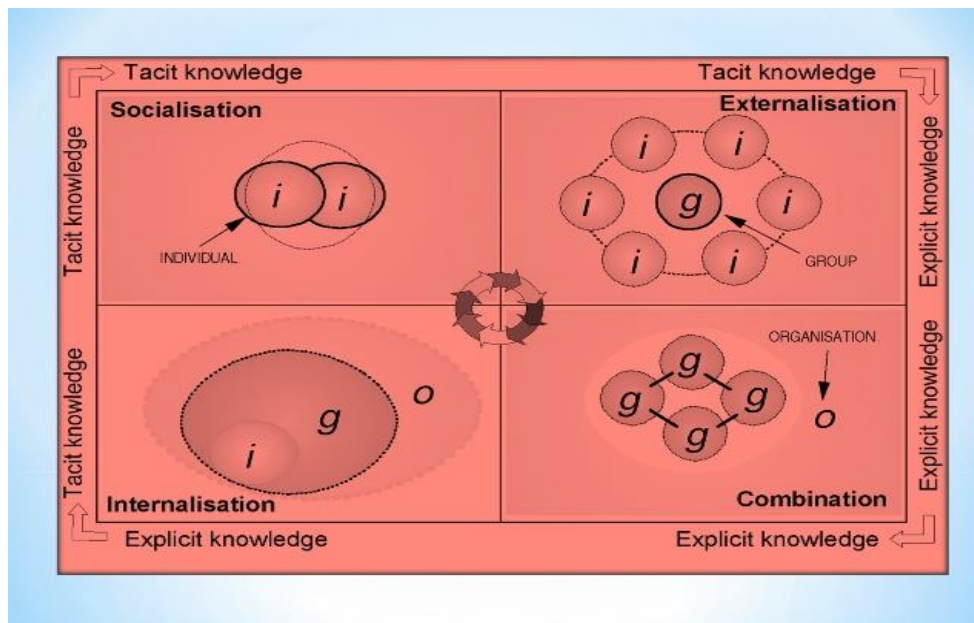
**Table 2.1: Characteristics of tacit and explicit knowledge**

<b>Tacit Knowledge</b>	<b>Explicit Knowledge</b>
This knowledge resides in human minds and it includes privately held insights, culture and values.	This knowledge is structured, articulated and documented.
It is drawn from experience and it is highly personal and is learnt by doing, watching and experiencing.	It is more visible to others and can be easily facilitated by means of Information Technologies.
It is hard to articulate.	Formal articulation is possible and can be processed by automated means.
It is difficult to communicate and share.	Can be easily communicated and shared.
It is hard to steal or copy.	Can be copied and imitated easily.
It can only be shared if individuals are willing to engage in social interaction.	Can be taught and transferred to others.
Undocumented knowledge.	Documented knowledge found in books, journals and databases.

The tacit knowledge approach highlights the understanding of the different kinds of knowledge that individuals in an organisation have (Collins, 2010). The approach allows people to transfer knowledge within an organisation and manage key individuals as knowledge creators and transmitters. Contrary to tacit, the explicit knowledge approach emphasizes processes for articulating knowledge held by individuals and designing the organisational approaches for creating new knowledge. This includes the development of information systems to disseminate knowledge within and beyond an organisation. Smith & Lumba (2008) suggests a blend of KM approaches to create a hybrid design for the KM practices in an organisation.

Examples of tacit knowledge identified by Pearlson & Saunders (2010) include experience of what has worked in the past projects which were managed by experienced professionals. On the other hand, examples of explicit knowledge include a manual, source code of a working program, a blueprint and a work template. Tacit knowledge makes knowledge workers more valuable as it is linked to the personality of the knowledge owner. Explicit knowledge can be patented and can be easily facilitated through the use of ICTs.

The two dimensions for knowledge creation, as identified by Nonaka, Toyama & Hirata (2008), and reviewed by Collins (2010), are epistemological and ontological. The epistemological dimension is concerned with the conversion of knowledge from tacit to explicit and vice-versa. The ontological dimension transforms knowledge from individuals to groups and then transfers that knowledge from groups to the organisation. The combination of these two dimensions has resulted in the formation of the coiled model for knowledge creation and processing which is used as reference by the majority of KM practitioners. The model is known by the acronym **SECI** (**S**ocialisation, **E**xternalisation, **C**ombination, and **I**nternalisation) and is shown on **Figure 2.2** below.



**Figure 2.2: The SECI model (Nonaka, Toyana & Hirata, 2008)**

The basic Ba concept provides a platform and shared space for advancing individual and collective learning. Ba is a shared space which serves as a foundation for knowledge creation (Choo & De Alvarenga Neto, 2010). The shared space can be physical, virtual, mental or a combination of these. Ba exists at individual, group or organisational level as shown in **Figure 2.2** above. **Socialisation** explains the social interaction to transfer tacit knowledge into explicit through meetings and brainstorming. **Externalisation** converts tacit to explicit by publishing and articulating knowledge. **Combination** converts explicit to explicit knowledge by organising and integrating knowledge. **Internalisation** finally converts explicit to tacit by receiving knowledge and application by the individuals. Carefully chosen technologies that support KM solutions are planned using this model as a framework. This study adopted the **SECI** model to solve the research problem which promotes a knowledge sharing culture in organisations. The effectiveness of KM can only be realised after a full understanding of the benefits of KM in an organisation.

## 2.5 Benefits of KM

The key advantage of KM is that knowledge is shared between employees and is not lost if an employee leaves the organisation for whatever reason. Davenport & Harris (2007) argue that the frontier for using knowledge to make decisions has shifted dramatically and they list the benefits of KM as follows:

- Leveraging core business competencies.
- Accelerating innovation.
- Creating competitive advantage.
- Strengthening organisational commitment.

Leveraging core competencies entails the collective learning of the organisation. Frost (2010) refers to core competencies as the organisation's primary expertise, which is the basis of sustained competitive advantage. Core competencies are recognised by first identifying and assessing them. KM is therefore responsible for the identification of knowledge locations and knowledge gaps. Sustaining core competencies improves the KM processes. The exact dynamics of the processes of knowledge creation, acquisition, sharing and re-use are central to the management of core competencies of identifying, sustaining and building.

Knowledge sharing increases innovation. It is worth noting that innovation is dependent on the availability of knowledge (du Plessis, 2007). The influence of knowledge has to be recognised and managed to ensure successful innovation. Both tacit and explicit knowledge play a role in organisational innovation, thus innovation has become a key piece for the achievement of sustainable competitive advantage. Research by Leal-Rodriguez (2013) reveals that connecting KM and innovation has become a necessity in most modern organisations.

Studies by Bosua & Venkitachalam (2013) demonstrate that organisations view KM as part of their strategic alignment. Creating competitive advantage through KM involves understanding and properly managing the organisation's intellectual property (Meihami & Meihami, 2014). Most observable intellectual property involves technologies, inventions, publications and processes which can be easily protected and patented. Competitive advantage refers to the strategies, skills and knowledge that differentiate a business from its competitors. Magretta (2011) argues that an organisation's ability to outperform its competitors lies in its ability to translate its competitive strategy into a competitive advantage. This competitive strategy involves positioning the firm favourably in business relative to its competitors.



Formalisation of knowledge permits the continuous process improvement that needs the utmost level of efficiency (Oliva. 2014: 1053). KM contributes to the improvement of organisational processes and developments. From an organisational viewpoint, the benefits of KM are many but not limited to the following:

- KM improves decision-making by making sure that correct and accurate information is used to make the best possible decisions.
- More so, KM enhances coordination and collaboration among teams.
- Furthermore, KM maximises the institution's use of existing shared wisdom and experience of human capital assets.
- KM allows for improved knowledge flow in an organisation, thereby enhancing the capability of the organisation to manage change.
- KM avoids wastage and repetition of tasks by promoting knowledge re-use.

If an organisation adopts KM, it is highly likely to be strategically and operationally effective (Rasula et.al, 2012). Strategic effectiveness results in competitive advantage whereas operational benefits improve inter-departmental communication and also improves the processes. According to the University of Cambridge (UK) dictionary, effectiveness means the ability to be successful and produce the intended results. Effective KM therefore entails embedding KM processes in an organisational context and using a strategy that works (Schiuma, 2012). Measuring effectiveness implies use of defined metrics and key performance indicators (KPI) to meet the objectives of a KM initiative.

Key performance indicators are generally defined by the organisation, and this is justifiably done in relation to the expertise and skills of the human resources personnel employed therein. The workers are obliged to enter into a performance contract where they specify what they hope to achieve in the working year, often called a performance agreement. This agreement is measured in key result areas, all which should estimate the effectiveness of the organisation and the individual.

Every undertaking and endeavour in a business organisation is associated with challenges. The challenges associated with KM implementation in organisations range from a lack of management support to failure by the organisations to keep up with new technologies and innovations (Toro & Joshi, 2013). Since KM is partially enabled by ICTs, the challenges associated with ICTs for KM are discussed in detail.

## 2.6 Challenges of ICTs for KM

King (2008) asserts that technology is a powerful tool for KM realisation and it is generally known that networks and databases are the main architectural blocks that support Knowledge Management. ICT enables search for information and communication amongst employees. Research by Heaidiri et al (2011) shows that IT is a key success factor that influences KM implementation but training of users on the use of associated technologies should not be taken for granted. Experiences documented in the past can be managed by and through technology use, operated by trained personnel (Becerra-Fernandez & Sabherwal, 2010).

ICT enables the transformation of knowledge through knowledge sharing systems (Muda & Yusof, 2015). Sharing means that the knowledge has to move from sender to receiver through a data communication medium. Organisations may suffer from the lack of adequate bandwidth to accomplish the transmission tasks. Research by Yadav et.al (2015: 18) has shown that even the best technology could fail if the users do not have the capacity to use such technology. ICTs have changed the way organisational members communicate and share information, thereby supplementing all modes of knowledge creation and transfer.

However, there are also challenges associated with the use of ICTs for KM, e.g. transformation of tacit into explicit format requires controlled interactions. Capacity building is an issue that has to be addressed in ICT usage, specifically for KM. Soto-Acosta & Cegarra-Navarro (2016) highlight that the relationship between ICT and KM is that ICT facilitates knowledge creation, sharing, storage and retrieval, including a host of other manipulations. All these processes are associated with very high costs for software, hardware and the network infrastructure to support them. Based on the collaboration criteria submitted by Tabrizi et al (2011), ICT is consequently viewed by many researchers as a catalyst and critical motivator to knowledge sharing in that it provides a platform for experts to share views and experiences.

Most ICTs used in today's organisations for KM were not designed for KM (Song, 2007). The technologies then were specifically designed for data and information processing as well as communication. Contemporary studies by Girard & Girard (2015) reveal that in KM, technology only contributes about 20% and the other 80% is associated with people who re-define and manipulate such technologies in innovative ways. Omotayo (2015) extrapolates that technology is developing at a phenomenal rate and organisations have to keep apace with the new technology and ensure that their knowledge is protected from competitors. Securing knowledge against those who might encrypt it is a challenge which requires experts in databases and database systems to determine where and how the organisational knowledge should be stored.

With the emergence of various technologies, institutions try to maintain a competitive edge by fully utilising ICTs to their advantage. ICTs facilitate and support various KM activities by providing an enabling environment and they can be used commendably to capture and share knowledge in most organisations. The biggest challenge lies on how these institutions can utilise ICTs at their disposal to capture, retain and share knowledge. IT is not just about computers, but also includes other technologies such as video conferencing. Song (2007) therefore logically argues that Information Technologies are just enablers for effective KM.

The other important factor for ICTs for KM is the level of computer literacy of the workers. Using ICTs for KM requires the users to be computer literate. In addition to users being literate, the infrastructure available at the institutions has a role to play. The access rights to various ICTs differs from one organisation to the other. More so, literature reviewed has revealed that some significant percentage of users in organisations are not computer literate, especially on using the ICT tools specifically for KM (Subashini et al, 2012).

In this 21<sup>st</sup> century, various IT tools are available for KM. The list of tools incorporates internet, e-mail, cell phones, discussion forums, knowledge repositories, best practices databases, groupware, electronic bulletins, Skype and intelligent search engines, just to mention some. Knowledge repositories, according to Liebowitz (2012), are on-line storehouses of expertise and documentation about a specific domain. Best practices provide users with multiple ways of accessing information and knowledge focusing on depth and quality rather than breadth.

Hansen et al (2014) conclude that ICT tools increase efficiency of KM processes. They further highlight that the use of ICT tools is based on principles of maximisation of accessibility and reliability. Different researchers propose and describe different KM processes all aimed at improving organisational effectiveness. The terms IT and ICT were used interchangeably but they refer to the same thing.

## **2.7 Knowledge Management Processes**

KM processes are more people-intensive and less technology-intensive than most practitioners and organisations believe. This observation is supported by King (2008), who perceives this common misconception about KM processes and advises this critical orientation towards KM processes.

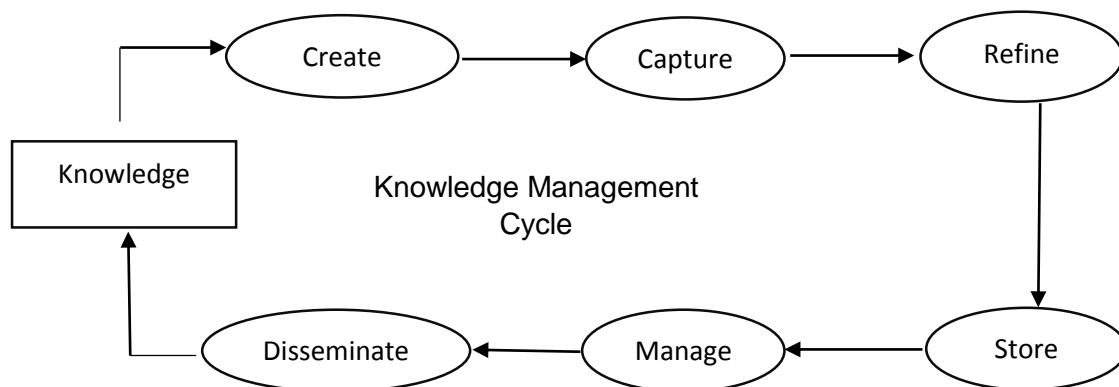
The following are the seven (7) KM processes identified by Becerra-Fernandez & Sabherwal (2010):

- a) Acquisition.
- b) Creation.
- c) Refinement.
- d) Storage.
- e) Transfer.
- f) Sharing.
- g) Utilisation.

According to the classical model offered by Nonaka, Toyana & Hirata (2008), the creation of knowledge occurs in a single dimension as tacit knowledge, and through social interaction, it becomes explicit knowledge to other individuals, groups, and ultimately to the organisation. Arguably, Jenkin (2013) states that organisational learning is recognised through four processes specifically, interpretation, intuition, integration and institutionalisation. These four processes take place within the individual, group and organisation, thus generating a seamless and continuous interplay between the tacit and the explicit forms of knowledge. Since knowledge creation is a process and knowledge itself is a strategic organisational asset, KM turns out to be a strategic pillar of enterprises that seek to create value for their shareholders and such a perspective is confirmed by Vasista & Al-Sudiary (2012).

Davenport & Harris (2007) elaborate that KM consists of three (3) processes, that is, creation, dissemination and use of knowledge to achieve the organisation's objectives. Likewise, Stewart & Mansingh (2010) advise that KM has four processes: generation, organisation, development and distribution. What Stewart & Mansingh add to the founding observations of the three critical processes developed by Davenport & Harris (2007) is the organisation component. This must be the case because all the knowledge within the organisation must be systematically organised for retrieval and distribution, including specific applications of this knowledge base. Management of the knowledge resources is therefore very important for organisations to be competitive.

All the KM processes have their roots in the Knowledge Management Cycle (KMC) which is the oldest model for KM but is still very helpful even in most modern organisations. The KMC is shown below:



**Figure 2.3: The Knowledge Management Cycle** (Turban, 2008: 372)

### 2.7.1 Knowledge creation

Knowledge creation is a dynamic activity that can enhance organisational success and is considered a driver for innovation in organisations. According to Ichijo & Nonaka (2007), knowledge creation takes place through socialisation, externalisation, internalisation and combination. The knowledge created using various processes can be reused by the same or other teams on similar future activities.

### 2.7.2 Knowledge capture

Knowledge capture is the process by which knowledge is changed from tacit to explicit form and vice versa through externalisation and internalisation (Becerra-Fernandez & Sabherwal, 2010). The knowledge captured might reside outside the organisational boundaries including consultants, competitors, customers and even suppliers. King (2008), views knowledge capture as knowledge acquisition. He argues that acquisition involves search for, recognition of and absorption of potentially valued knowledge.

### 2.7.3 Knowledge refinement

Refinement is all about modification, fine-tuning and improvement of the knowledge that has been acquired. In this case of KM, refinement selects, filters, purifies and optimises knowledge for inclusion in various storage media. Filtering prepares knowledge to be stored, after going through classification and categorisation (Ghassan, 2009). Knowledge refinement is considered by IGI Global (2016) as a process of analysing, evaluating and optimising knowledge to be stored in the knowledge repository.

#### **2.7.4 Knowledge storage**

Knowledge storage is concerned with the archiving of the created, captured and refined knowledge. This storage could be done on external storage media as well as other documented processes. Sub-processes of knowledge storage are concerned with linking and indexing. The knowledge storage process is supported by knowledge storage systems. Knowledge storage is very crucial for future use as reference and it should be integrated with knowledge transfer to create organisational value (Jasimuddin, 2008).

#### **2.7.5 Knowledge transfer or management**

Knowledge transfer is synonymous with knowledge management. Knowledge transfer process involves the focused communication of knowledge from the sender to a known receiver (King, 2008). Knowledge transfer is considered by KM practitioners as an integral part of every organisation. Thus, for knowledge to have an organisational impact, it must be transferred and shared. Frost (2014) maintains that the organisation's success is based on its ability to transfer knowledge. In line with this view, Hendricks (2009) contends that knowledge transfer provides opportunities to enhance the organisation's competitive advantage.

#### **2.7.6 Knowledge sharing or dissemination**

Knowledge sharing or dissemination is the core process of KM (Wang & Noe, 2010). This is because the main goal of KM is to foster the flow of knowledge among individuals. Bradley & McDonald (2011), add that a successful KMS is a shared system where people can retrieve and contribute to the knowledge base. They further stress that people must speak the same language for them to be able to share or disseminate knowledge. Hung et al (2007) propose that knowledge sharing structures should be based on job expert training, focus group meetings and workshops. Sharing in such a manner involves socialisation and exchange.

**Table 2.2** on the next page shows the different KM processes as understood by different authors.

**Table 2.2: Knowledge Management processes by author**

<b>Author</b>	<b>KM Processes</b>
Becerra-Fernandez (2010)	Acquisition, Creation, Refinement, Storage, Transfer, Sharing, Utilisation.
Frost (2014)	Discovery and Detection, Organisation and Assessment, Sharing, Reuse, Creation, Acquisition.
Koenig (2012)	Acquisition, Storage, Distribution, Use.
Costa & Monteiro (2016)	Creation, Application, Codification, Sharing, Storage.
Nonaka, Toyana & Hirata (2008)	Socialisation, Externalisation, Combination, Internalisation.
Sokhanvar, Mathews & Yarlagadda (2014)	Creation, Capture, Transfer and Reuse.
Alavi & Kaivanpanah (2008)	Creating, Storage/Retrieval, Transferring, Applying.
The Gartner Group (2014)	Create, Organise, Capture, Access, Use.
KPMG (2016)	Creation, Sharing, Application.
Zack (2007)	Acquisition, Refinement, Storage Retrieval, Distribution, Presentation.

A closer look at these various processes by different authors shows us that knowledge is created, transferred, utilised and shared. This study concentrated on the sharing process among staff members at universities and consulting engineering firms identified. Some of these processes are manual and some are automated to meet organisational goals within short time frames. All the KM processes discussed above are important in the development and implementation of KMS. King (2008) adds that KMS are less automated because they require human activities in their operations.

## **2.8 Knowledge Management Systems (KMS)**

KMS are a combination of mechanisms and technologies that are developed to help KM processes as described by Becerra-Fernandez & Sabherwal (2010: 62). Since the inception of KM more than two decades ago, very little research has been done to guide the implementation of such KMS in specific organisations, especially in developing economies. When developing KMS, it is important to develop metrics that optimally weigh the accrued benefits and quantify these (Hoss & Schlusser, 2009).

Effective KMS encompasses more than just technology, but wide organisational and cultural factors. To this end, resolution of organisational and cultural concerns is recognised as a main focus in the arrangement of KMS. This consequence is very consistent with the literature, which supports behavioural and organisational change management as success elements in implementing novel Knowledge Management Systems (Alavi & Kaivanpanah, 2008). Change Management refers to the introduction of new processes into an organisation (Hiatt & Creasey, 2012) and its focus is on enhancing efficiency.

Organisation of KMS distinguishes them according to the KM processes that they generally support (creation, storage, transfer and application). Exploratory studies by Benbya (2008) concentrated on bridging the gap between tacit and explicit knowledge. Recent research has been strengthened and identifies that mechanisms should be put in place to direct and guide KM programmes (Schroeder, Pauleen & Huff, 2012: 14). In the following segment, the study identifies the Knowledge Management Systems which make use of Nonaka, Toyana & Hirata's SECI model on page 24.

### **2.8.1 Knowledge discovery systems**

Discovery means development of original tacit or explicit knowledge from the synthesis of previous knowledge (Becerra-Fernandez & Sabherwal 2010). Discovery relies on the two processes of combination and socialisation. Nonaka et al (2008) are therefore apt in defining socialisation as the creation of tacit knowledge across individuals, usually accomplished through mutual efforts rather than written instructions.

### **2.8.2 Knowledge capture systems**

Knowledge capture retrieves both explicit and tacit knowledge that resides in people and organisational units. Based on the work of Nonaka et al (2008), internalisation and externalisation assists in capturing tacit and explicit knowledge. Externalisation entails altering tacit into explicit forms such as words while internalisation focuses on the transformation of explicit knowledge into tacit knowledge, representing the traditional way of learning.



### **2.8.3 Knowledge sharing systems**

Knowledge sharing processes involve the communication of knowledge to other individuals. Wang & Noe (2010) explain that knowledge sharing means real transfer, so that the receiver of such knowledge can understand such transmission without hindrance. More so, these two researchers add that what gets shared is knowledge and not the recommendations based on knowledge. Knowledge sharing in such a context takes place across individuals, teams and organisations.

### **2.8.4 Knowledge application systems**

Application rests on the knowledge available to users and organisations. Knowledge is reliant on the practices of discovery, capture and sharing. Routines in knowledge application systems incorporate the use of knowledge that is entrenched in procedures and rules that guide behaviour. In reality, knowledge application enables efficiency.

An analysis of KMS implemented in the past shows that there are underlying success factors behind the development of such systems. Evans & Ali (2013) identified cultural, structural, managerial and technical mechanisms that affect KM and KMS effectiveness. An organisational culture which supports KM basically means such an organisation enables knowledge sharing. Organisational structures can be formal or informal. Studies by Chen & Huang (2007) reveal that a decentralised structure is the best for effective KM. On the technical aspect, many organisations fell victim to the technology productivity paradox in KM (Benbya, 2008) because they tried to implement KM as an IT system.

In the hierarchy of educational objectives developed by Jerome Bruner, application skills are essential and intermediate to the higher order skills of evaluation and synthesis. In the relative hierarchy of these skills, it is therefore essential to ensure that structural, managerial and technical skills are fully developed and applied for organisational effectiveness.

The following section discusses the KM success factors in general as they apply to different organisations. KM success factors are very important for organisations to realise their goals and objectives and must also create quantifiable value to the organisations. Critical success factors lead to continuous learning of systematic organisational processes and practices. This learning is supported by a well-developed ICT infrastructure.

## **2.9 Knowledge Management success factors**

Some sources like the British Journal of Economics, Finance and Management Sciences (2012), refer to the KM infrastructure as critical success factors for organisations. For this study, infrastructure and success factors refer to the same framework. Most companies have provided their staff with the necessary tools for managing knowledge and using lessons learnt from early adopters. Some essential elements of KM are built into the definition as described by Liebowitz (2012). In this study, KM is conceptualised therefore as a set of approaches and methods which shows the way to do things in purposively selected Namibian organisations.

The five (5) major infrastructural components in the organisational context are described below:

### **2.9.1 Organisational culture**

Organisational culture refers to the norms and beliefs that direct the performance of an organisation's staff (Hassan & Al-Hakim, 2012). Organisational culture is regarded as a KM enabler in many organisations. Becerra-Fernandez & Sabherwal (2010) argue that challenges to KM are often non-technical. The researchers further highlight that employees do not have enough time for KM and consequently they downplay its critical importance in the functioning and efficiency of the organisation. Organisational culture is also viewed by Anderson (2009) as the combination of shared histories, anticipations and social duties that compel productive behaviours in an organisation. If an organisation has a culture of sharing, implementing knowledge sharing becomes easier, as revealed in literature.

Management should try to eliminate negative impediments to knowledge sharing (Wang & Noe, 2010). Employees want to share their knowledge and they want others to know that they are capable and knowledgeable. The barriers to knowledge sharing should be broken in order to give employees the most appropriate tools and the most conducive environment that they need for enhanced productivity and actualising their competitive edge. By designing KM initiatives around organisational culture, the organisation initiates a cultural dialogue that enhances change. International organisations involving workforces with different cultures pose problems for knowledge sharing (Minbaeva, 2007). In order to manage such challenges, reward systems should be modified for the knowledge sharing efforts displayed and enacted by the organisation's workforce.

### **2.9.2 Organisational structure**

A hierarchical organisational structure affects the people with whom they collaborate and share knowledge. Flattening organisational structures eliminates organisational layers and ineffective bureaucracy (Chen & Huang, 2007). Knowledge sharing is likely to take place when people are in decentralised organisations where such organisations can use CoP to facilitate knowledge sharing. According to Wenger (2014), CoP are self-organised groups of expert individuals who are dispersed physically but communicate frequently and collaborate on subjects of mutual organisational interest. These researchers add that the probability of sharing knowledge among and within a Community of Practice is very high.

Researchers in KM have also revealed that knowledge sharing could be eased by a less centralised organisational structure that apparently inhibits such openness (Kim & Lee, 2008). Frost (2010) also advises that a formal organisational structure should not be so rigid so as to disallow knowledge sharing. Others have recommended a combination and hybrid format of centralised and decentralised approaches in the organisation's hierarchy, contending that organisations should have KM support groups in their structures.

### **2.9.3 Information Technology infrastructure**

An organisation cannot support its staff to share knowledge if it does not have a strong IT infrastructure (Song, 2007). Most organisations focus much on IT, resulting in the inevitable failure of the KM processes. The KM team should take time to understand the needs of the users. They should match the goals of the KMS with the global objectives of KM and organisational success. The KM team should pick the appropriate technology that ensures sustainability and scalability. Simplicity of technological interface and appropriateness of user's desires are important factors to be taken into consideration during development of KM technological systems.

IT infrastructure includes communication technologies, systems, databases and Enterprise Resource Plans (ERP). ERPs offer a superb platform for knowledge aggregation (Przemyslaw, 2014). Information Technology (IT) therefore requires adequate training in order to keep apace. KM is supported by suitable technology and individuals who know how to operate such technology. In this millennium, technology is able to conquer the time and distance barriers which could limit KM activities in the recent past. It is therefore important to understand how to align technology with KM processes and strategies as advised by Alavi & Kaivanpanah (2008).

#### **2.9.4 Leadership**

Leadership is considered as a very important element to effective KM implementation in modern organisations (Lehner & Haas, 2010). A qualified and experienced leader is a role model for others in a continuous learning context. Other researchers like Hassam & Al-Hakim (2012), view leadership as management support or executive support provided to the workforce. All efforts in an organisation require advice, guidance and support from such leadership and consequently it is defined as the support of management for achieving KM undertakings. These researchers have studied the connection between leadership and KM and considered the leadership role as key to organisational competitiveness and ultimate success.

Tasmin & Woods (2008) add that without executive or leadership support, no KM effort would yield the desired results of acute competitiveness. Carmel et al (2013) posit that leaders who support knowledge sharing are highly likely to motivate their employees to share knowledge in their organisations. It is therefore plausible that there is an influence of a knowledge sharing leader on innovation. Knowledge sharing, both internally and externally, is closely associated with innovation (Sheehan, 2014). Different leadership styles including directive, charismatic, participative and transformational varieties may result in KM success.

#### **2.9.5 Physical environment**

Physical set-up can elevate KM by providing a platform for staff members to meet and share different ideas linked to Knowledge Management (Becerra-Fernandez & Sabherwal, 2010). Most organisations take the physical environment for granted. Knowledge sharing is not by design, but a good and big boardroom for instance provides employees with enough space to share ideas. Face-to-face meetings enable people to learn from each other and the physical environment could foster strategic KM by providing convenient chances for staff members to share philosophies.

Researchers like Mosconi & Roy (2013) consider that KM is based on four dimensions: culture, strategy, structure and technology. Massingham (2014) concurs with this submission but argues that KM framework has only three parts namely, strategy, implementation and management decision. The KM success factors are supported by proper tools and technologies to ensure organisational effectiveness as explained in the following sections.

## **2.10 Tools and technologies to support KM**

KM technologies are ICTs that can be used to assist KM. It should be noted from the onset that information technologies in KM focus on KM and not on data processing. KM tools support KMS and benefit mainly from the IT infrastructure (Rhem, 2016). KM technologies support artificial intelligence technologies including those used for electronic discussion groups, decision support systems, databases, expert systems and best practices. O'Dell & Hubert (2011) describe expert systems as responsible for changing the way businesses function by altering and redefining the way people think about problem-solving.

There are several tools which can be used in organisations for effective KM. Therefore, organisations can choose the best tools which suit their needs and make use of them to manage their valuable knowledge. According to the APQC (2010), tools and technologies for KM are categorised into two (2): IT tools and non-IT tools.

### **2.10.1 Information Technology (IT) tools**

The IT tools that support KM are:

- Knowledge bases
- Blogs
- Social networks
- Document libraries
- Collaborative virtual workspaces

Knowledge bases create new knowledge for a given topic whilst document libraries lead to document management systems used mostly in libraries (APQC, 2010). Identification of knowledge areas in an organisation might improve performance. A blog is defined in many sites as an online journal that allows one to write about a topic and get suggestions and or comments from responsive readers. Social networks permit finding people with similar interests and enable these to share content (Wang & Noe, 2010). Document libraries improve the way people store, access and share documents; thus enhancing collaboration. Boh et al (2007) stresses that collaborative virtual workspaces permit people to work together regardless of their physical locations. These IT tools work hand in hand with the non-IT tools as explained in the following sections.

### **2.10.2 Non-Information Technology (Non-IT) tools**

On the other hand, the non-IT tools identified by the APQC (2010) which support effective KM are the following:

- Brainstorming
- Storytelling
- Communities of Practice
- Collaborative physical workspaces
- Learning reviews

Brainstorming is suitable when one wishes to generate an array of ideas and possibilities that go further than the obvious set (Young, 2013). Considering that the KM processes involve identifying, creating, storing, sharing and applying knowledge, brainstorming is a tool used to create knowledge. This brainstorming process is divided into the divergence and convergence phase. In the divergence phase, judgment is delayed and all ideas are regarded as valid. Convergence allows participants to use their judgment in a positive manner and there are guidelines to be followed when brainstorming to accomplish this essential convergence.

According to Whyte & Classen (2012), storytelling is a vital tool for transferring tacit knowledge. In addition, storytelling allows sharing of deeper knowledge than the IT tools. Several organisations make use of storytelling to transfer experts' knowledge to the younger generation. Storytelling can be used to share lessons learnt from antecedent projects with co-workers who did not participate in the activity. Collaborative physical workspaces support knowledge sharing to a great extent if they are well designed. Learning reviews allow team members to learn continuously while working on a given project.

CoP may possibly exist in a section of an organisation or across various divisions of an organisation or even outside the boundaries of specific organisations, depending upon the objectives (Wenger, 2014). The size of CoP ranges from 2 – 3 people to hundreds or thousands of individuals. The three elements that are essential when designing a CoP are:

- The domain.
- The community.
- The practice.

CoP can be either IT-based or non-IT-based, depending on characteristic considerations of the community members. In KM, the problem lies in the selection of the best tools for effective KM, hence the need to incorporate management and users.

Collaborative physical workspaces in the KM context, basically means the settings in which employees work in. Young (2013) stresses that a well-designed workspace can support knowledge creation and sharing. He further argues that a physical workspace is much more than just meeting rooms with desks, but creative discussion rooms specifically designed for such activities. The design of decent physical workspaces to support knowledge sharing varies depending upon different kinds of interactive scenes that an organisation needs (Lehto & Salo, 2014). Examples of workspace design include space for team collaboration equipped with a lot of devices. Space for prototyping allows turning of ideas into value when they are put into action. Space for prototyping is where people have an opportunity to experiment with their ideas and produce working models.

Learning review is a technique used by a project team to help individuals during the work process (Collison et al, 2009). The technique could be conducted after an identifiable event. Learning reviews allow team members to always learn while carrying out a specific project. In an effort to improve the project, team members need to learn quickly and adapt to different situations. In most cases, team members carry on with a project without reflecting until the completion of the said project. Collison et al (2009), observed that it is not good to wait for the end of the project for the review to draw out the lessons learnt and he advises learning while doing to enable immediate learning from both successes and failures, irrespective of the project duration. The Learning reviews revolve around questions such as: What was supposed to happen? What actually happened? What have we learnt?

These are questions that are seriously considered for instance in the Content, Input, Process Product (CIPP) evaluation framework developed by Daniel Stufflebeam (2014). In this model, the learning process is recursive at the initiation, development and implementation of the programme.

Combining IT tools and non-IT tools for KM might improve organisational performance. IT tools helps organisational employees during the automation of KM processes. This automation starts from the non-IT tools where these processes are designed starting with brainstorming on the activities or Communities of Practice from a well-designed physical workspace. Implementation of KM is always blocked by several barriers which exist in different organisations as reviewed in the following section.

## **2.11 Barriers to effective Knowledge Management**

There are several elements that negatively affect the realisation of KM in organisations, and these are commonly known as KM barriers. Riedge (2007) classifies knowledge sharing barriers into three (3) categories: organisational barriers, technological barriers and individual barriers. Contemporary studies attempt to find ways to overcome these barriers and improve organisational performance. Some of the barriers to effective KM are listed below and explained in detail in the paragraphs that follow:

- Lack of executive support
- Resistance to change
- Prohibitive organisational structures
- Lack of clear return on investment
- Lack of budget to support KM efforts
- Lack of technological infrastructure and using wrong tools
- Lack of accessibility
- Lack of knowledge culture and cultural differences among employees
- Lack of time, motivation and rewards
- Lack of trust
- Inefficient communication and lack of training
- Differences in levels of education
- Lack of appropriate methodologies

Executive support is necessary to create a conducive environment that inspires and supports knowledge sharing and blocks the barriers that may exist in organisations. Evans et al (2014) is of the opinion that some companies appoint KMOs specifically in charge of formulating knowledge policies. In addition, implementation of KM is often blocked by top management's resistance to change, particularly with regard to people, processes and the associated technology (McCalman & Siebert, 2016).

Singh & Kant (2008) noted that barriers to KM are linked to organisational structure, technology and cultural resistance. Both technology and organisational structure are regarded as successful factors facilitating knowledge sharing, but other researchers like Oliva (2014) consider them as main barriers to effective KM. Managers are therefore encouraged to form organisational structures and adopt IT tools that enable knowledge sharing.



Managing knowledge requires changes in terms of the tools used (Singh & Kant, 2008). The process of overcoming resistance is lengthy and cumbersome. Managers should be involved during the initial planning and all parties concerned should be informed as soon as possible to ease fear and anxiety that often accompanies organisational restructuring and change. Singh & Kant (2008) extend that the more the people communicate about change, the easier the process becomes to effect change. Bloice & Burnett (2016) propose that objectives for KM ought to be written down before embarking on the actual process and managers should suggest metrics that are designed and refined to measure the effectiveness of an organisation after implementation of KM.

Technological infrastructure serves as a warehouse where knowledge can be stored and retrieved when needed (Massingham, 2014). KMOs should assess the needs of the users first before selection of appropriate tools and implementation. Simple technology, which is easier to use, is preferred as it allows users to communicate and collaborate effectively. Tools for sharing knowledge should be updated regularly to match the rapid technological advances of this globalised world. These technological advances may help organisations to gain competitive advantage.

KM is valuable only if knowledge is available as and when needed. With the advent of mobile tools and technologies, knowledge should be accessible anytime and anywhere. This could be on mobile devices or over the Internet. Organisational aims can only be realised if organisations integrate the practice of motivation to its workers (Singh & Kant, 2008) because workers can only share their valuable knowledge when they are motivated. Lack of training entails inability to use new technologies by the staff members. Should this be the case, then untrained employees may be a compromising hurdle, resulting in low production by the organisations and loss of customers as they cannot provide satisfactory customer service.

KM could fail due to lack of appropriate methodology and enterprising organisations have to understand all the steps and guidelines for KM implementation, a point which the APQC (2010) emphasises. These KM barriers are discussed in detail in the following sections to see how they really block KM implementation. This may broaden our understanding of these barriers in organisations and suggestions by other researchers on how to remove them.

### **2.11.1 Lack of executive support**

Executive support creates a conducive environment that inspires and stimulates knowledge sharing. Organisations engage KMOs specifically to formulate and implement knowledge policies. Management support is needed for leadership, responsibility and acceptance with a clear organisational vision (Singh & Kant, 2008). In addition, management support is needed for risk management and project governance which ensures that KM objectives are met on time. Effective KM requires long term support and commitment of management (Chong & Choi, 2015). Ujwary-Gil (2011) asserts that the lack of executive support is a critical barrier which blocks KM implementation in most organisations. Management is therefore responsible for the identification of opportunities and threats from competitors and Oliva (2014) advises that management should support and encourage KM undertakings in organisations.

### **2.11.2 Resistance to change**

According to Awad & Ghaziri (2007), resistance to change is a barrier to effective KM. Organisations are changing the way they operate and the way they integrate new technologies into their operations, but people still resist change even if such change brings greater efficiency and productivity. Beitler (2013) states that change is not a problem but it is the resistance to change that becomes the problem which has to be addressed. Proper management of knowledge may require changes in the tools to be used or a complete organisational overhaul to the extent that Ujwary-Gil (2011) states that it is very normal to expect resistance to change when implementing KM. Overcoming resistance to change may be done by utilising a structured change management approach and identifying the causes of [such] resistance.

### **2.11.3 Prohibitive organisational structures**

Some organisational structures prohibit knowledge sharing in organisations. The most common organisational structures are centralised and decentralised (Dermol & Rakowska, 2014). In a centralised structure, authority to make decisions is retained by top level managers whereas in decentralised structures, authority to make decisions is delegated at all levels in the hierarchy. Other sources in organisational theory like Daft (2011) refer to them as formal and informal structures. Formal organisational structure, like centralised formats, provides a framework for defining managerial authority, responsibility and work division. An informal structure, also like the decentralised format, is social with shifting lines of authority. Flattening organisational structures might have a positive impact on knowledge sharing, explaining the reason Singh & Kant (2008) suggests that organisations are advised to adopt an organisational structure which matches and supports their specific strategies.

#### **2.11.4 Lack of clear return on investment**

Every investment should at some point yield quantifiable results, and to that extent, KM is an organisational investment which should yield tangible results. Many studies have failed to quantify KM investments as observed by Hoss & Schlusel (2009) in his study on the metrics deployed to measure KM in organisations. These researchers advise that there should be a significant business impact on productivity after a KM investment. It is logical to conclude that developing a plan and clearly showing return on investment is important to ensure KM success in organisations.

#### **2.11.5 Lack of budget**

Without a proper budget and enough finances, no KM efforts would yield results (Frost, 2014). Lack of budget is closely associated with executive support because all the budgets are created and implemented by the organisation's top management. Goodluck (2011) states that the major inputs for KM budget include finance, labour, equipment and materials. These factors are the main contributions to the KM plan such that realistic budgets are preferable and must include recurrent revenue and recurrent expenditure. A KM budget helps organisations figure out their long term goals and work towards them. Frost (2014) advises that organisations create sufficient budget and avail enough finances for KM projects to succeed.

#### **2.11.6 Lack of technological infrastructure**

Singh & Kant (2008) consider lack of technological infrastructure as a barrier to effective KM. Most of the issues in KM are culture-based but the technological aspect should not be taken for granted. A wide array of IT tools are available for supporting effective KM, including business intelligence applications, knowledge bases and knowledge portals. Song (2007) is of the idea that ITs are just enablers to effective KM as they provide platforms for knowledge sharing. Without a solid IT infrastructure, it is very difficult for organisations to realise their KM goals especially in this century which is driven by technological advances (Chua, 2014). Currently technology is able to overcome space and time barriers through cloud computing and Riedge (2015) advises that staff members in an organisation set realistic expectations as to what technology can do and cannot do. He further argues that there is a lack of compatibility between various IT systems and KM processes, adding that simple technology aligned with organisational objectives may be ideal.

### **2.11.7 Lack of knowledge sharing culture**

Lack of a knowledge sharing culture is considered by many KM researchers as a barrier to effective KM. Knowledge sharing is at the heart of KM because knowledge must be shared and transmitted to the right person at the right time to make appropriate decisions which might improve organisational performance (Saenz et al, 2012). An appropriate organisational culture is a key aspect of successful KM implementation where the values and beliefs of the organisation's staff make up an organisational culture which should be committed to knowledge sharing. People should be willing to share their knowledge with others and by so doing learning takes place which benefits individuals, groups and eventually the organisations.

A sharing culture reflects the multiple aspects which consist of mostly collaboration and trust (Singh & Kant, 2008). Trust is one of the characteristics of the knowledge friendly cultures that fosters the relationship between individuals. In addition, trust facilitates proactive knowledge sharing. Effective knowledge sharing ensures that the organisation builds trust and adopts best practices.

### **2.11.8 Lack of appropriate methodologies**

Lack of appropriate methodologies as a main barrier to effective KM has been in existence for more than two decades. Schroeder, Pauleen & Huff (2012), found that there is no universal methodology for implementing KM in organisations. Different methodologies are used for different organisations depending on the organisational long term goals and objectives. Regardless of executive support, organisational structure and technological infrastructure, KM may fail due to lack of appropriate methodologies. Singh & Shankar (2009) advises that successful KM implementation requires a set of implementable methodologies.

In this KM context, methodology describes the set of activities which are brought in to bear during the KM implementation. Authors like Dalkir (2011) and Riedge (2007) have advocated the step-by-step methodology for KM implementation. Chalmeta & Grangel (2008) suggest that a KM implementation methodology be organised in phases, stating the activities to be carried out, tools to be used and the expected results of each phase.

### **2.11.9 Other barriers**

The barriers discussed above are not the end all. Other barriers include lack of accessibility, lack of time, motivation and rewards. KM is most useful if knowledge is available when needed. Most managers, ironically, do not have enough time to implement and manage KM projects. Employees can only have time for KM if they are motivated to do so and are rewarded accordingly for such efforts by the responsible management structures. Other barriers along the spectrum include lack of trust, which explain why Singh & Shankar (2009) asserts that, without motivation such as rewards and recognition, organisations cannot align KM with their business needs. A low level of trust reduces the effectiveness of an organisation and this proposition is supported by Rutten, Blaas-Franken & Martin (2016: 208) who also noted that a lower level of trust within CoP results in less knowledge sharing.

In response to these challenges, many organisations extrinsically motivate their employees through performance bonuses. Targets related to performance are set at the onset of the year and reviewed periodically. The most productive workers, those who exceed minimum requirements are paid extra in the performance bonuses.

Knowledge has been perceived as the most critical resource an organisation could ever generate and protect. Moreover, it is a valuable organisational survival tool which must be effectively managed. Inefficient communication and lack of training are also among other important barriers which should be removed by proper training. Lack of training starts from misunderstanding the meaning of KM in an organisational context and the benefits it might bring about. To that extent, effective communication is a very important characteristic of all knowledge workers since an organisation is likely to be less effective if there is no proper communication.

Most of the studies (Singh & Kant, 2008) conducted in the past concentrated on identification of KM barriers without looking at the most feasible and possible solutions to the identified barriers. Overcoming the KM barriers might improve the effectiveness of an organisation as explained in the following section which emphasises on the effectiveness of KM with particular reference to organisations.

## **2.12 Knowledge Management and organisational effectiveness**

Organisational performance improvement is the ultimate goal of KM (Mosconi & Roy, 2013). Effectiveness means carrying out the appropriate processes and making the most feasible decisions at the right time. Such effectiveness results in fewer mistakes and adaptation to changed environments. KM must start with organisational leaders and managers (Rasula et al, 2012), implying that the tools, techniques and strategies used by organisational managers should retain, organise and share business expertise. Little inquiry has been done so far in existing literature and research to identify which KM tools work for selected organisations. Motivation of members to participate and share knowledge is a critical success factor for organisational effectiveness.

Managers should focus on knowledge growth, transfer and implementation (Omotayo, 2015). From an organisational perspective, investments in KM should be seen as capital projects because it is logically contended that KM is the beginning of organisational transformation and appropriate conditions that allow all knowledge to emerge should be created. The factors motivating the need for KM include organisational survival, globalisation effects, competitive differentiation and an aging workforce. An organisation can only be effective if it retains the expertise of its employees since this undertaking definitely enhances customer satisfaction and increases profits and revenue for the company.

Organisational learning permits the organisation to grow in response to the available technology and market demands (King, 2008). KM enables organisations to be more effective by selecting and performing the most appropriate processes (Rasula et al, 2012). Success in this regard relies on implementing lessons learnt rather than just identifying them. Lessons learnt should be embedded into processes so that the next time there is a similar challenge and task, then action can be taken instantly. This observation explains why Hoss & Schlusell (2009) highlight the need for measuring how effective an organisation performs after implementing KM strategies.

Creating, organising and utilising knowledge in organisations enhances performance (Rasula et al, 2012). KM positively affects organisational outcomes such as innovation and employee improvement. Business processes, culture, leadership, policies and innovation are some ways of improving organisational performance (Kalling, 2007). It is therefore submitted that an organisation can be very effective if knowledge is shared among co-workers as discussed in the following segment on knowledge sharing in organisations.

## **2.13 Knowledge sharing in organisations**

It has been proposed that the realisation of KM initiatives rests on knowledge sharing (Wang & Noe, 2010). Managers under the current circumstances are still struggling to find the right incentives to support knowledge sharing in organisations. Knowledge is a vital resource that offers competitive advantage in an economy (McAdam, Moffet & Peng, 2012). Organisations should look at how to transfer knowledge from the experts to the trainees (Lievre & Tang, 2015). Institutions need to emphasize using knowledge-based resources that are already available within the organisations (Saenz et al, 2012; Abdullah, Stuart & McQueen, 2016).

Knowledge sharing is an important means through which workers could contribute to knowledge application and innovation in the organisation where such sharing among staff members allows organisations to exploit knowledge-based assets (Lievre & Tang, 2015). The studies cited here were conducted using case studies and they have demonstrated that knowledge sharing reduces costs in organisations. The benefits of knowledge sharing have forced numerous organisations to implement KM initiatives and developing KMS though at a slow pace without appropriate methodologies. Rutten, Blaas-Franken & Martin (2016: 208) noted that a lower level of trust within CoP results in less knowledge sharing.

It used to be said “knowledge is power”, but with the introduction of KM as a discipline, this has now been transformed to “knowledge sharing is power.” Many experts would ask themselves why they should share knowledge when many see knowledge sharing as putting their jobs at risk. Knowledge sharing is socialised and all new knowledge is created through purposeful interactions between professional individuals (Paraponaris & Sigal, 2015: 889). Employees should be highly motivated for them to share what they know. This could be in the form of reward systems or other initiatives and in such instances managers should adopt a culture of knowledge sharing that aims to improve organisational effectiveness.

Since knowledge sharing is a critical element of KM, its effective utilisation is of paramount importance for organisational survival. Wang & Ahmed (2007) states that the main benefit of knowledge sharing in an organisation is to build dynamic and innovative capabilities, including the extension of networking with other professionals. Knowledge sharing and knowledge withholding depends on the forms of motivation available. The quality of motivation to share knowledge is very important to understand in the work context, a point that Stenius et al. (2016: 181 - 198) repeatedly emphasise.

## **2.14 Motivational factors for knowledge sharing**

According to Deci (2012), motivation is a key element of any behaviour. Motivation may vary in quality, thus affecting the quality of behaviour. Knowledge sharing is a process where people exchange knowledge and together create new knowledge (Hendricks, 2016). The quality facet of motivation is important for knowledge-based work which is cognitively demanding and where productivity is more of a quality function than one of quantity. One has to be motivated to share what he or she knows and this may improve organisational performance.

Knowledge is a resource that is locked in the human mind. Many organisations are missing out on opportunities when their use of incentives do not take organisational cultures, national cultures and personal motivational factors into account (Gammelgaard, 2007). Individual knowledge sharing is dependent on the incentives offered, national backgrounds, type of organisation, and the KM strategy implemented. The following general factors are important for workers to share knowledge:

- Recognition
- Rewards
- Promotion
- Pay for performance
- Bonuses

KM requires a unique view of rewards and recognition as observed by the APQC (2010). Recognition is visible, public reinforcement to individuals and teams for contributions and role modelling of behaviour, such as a formal thank-you (Sunil, 2014). This recognition may be at the individual, group, department, business, or organisational level within an organisation. It is also important to highlight that recognition may or may not be accompanied by a reward. Rewards like money, promotions and substantial gifts are more tangible forms of motivation. At lower levels, rewards recognise desired behaviours and such recognition oftentimes stimulates productivity.

The use of incentive systems is needed to motivate workers to share knowledge where an employee can be extrinsically or intrinsically motivated. Extrinsic motivation obtains goals that are apart from the work itself while intrinsic motivation allows employees to gain personal satisfaction from doing the job (Deci, 2012). Salaries, bonuses and promotions have been found to be the most common motivation mechanisms that support knowledge sharing in organisations. Knowledge can be shared through the use of social media platforms which are readily available online.



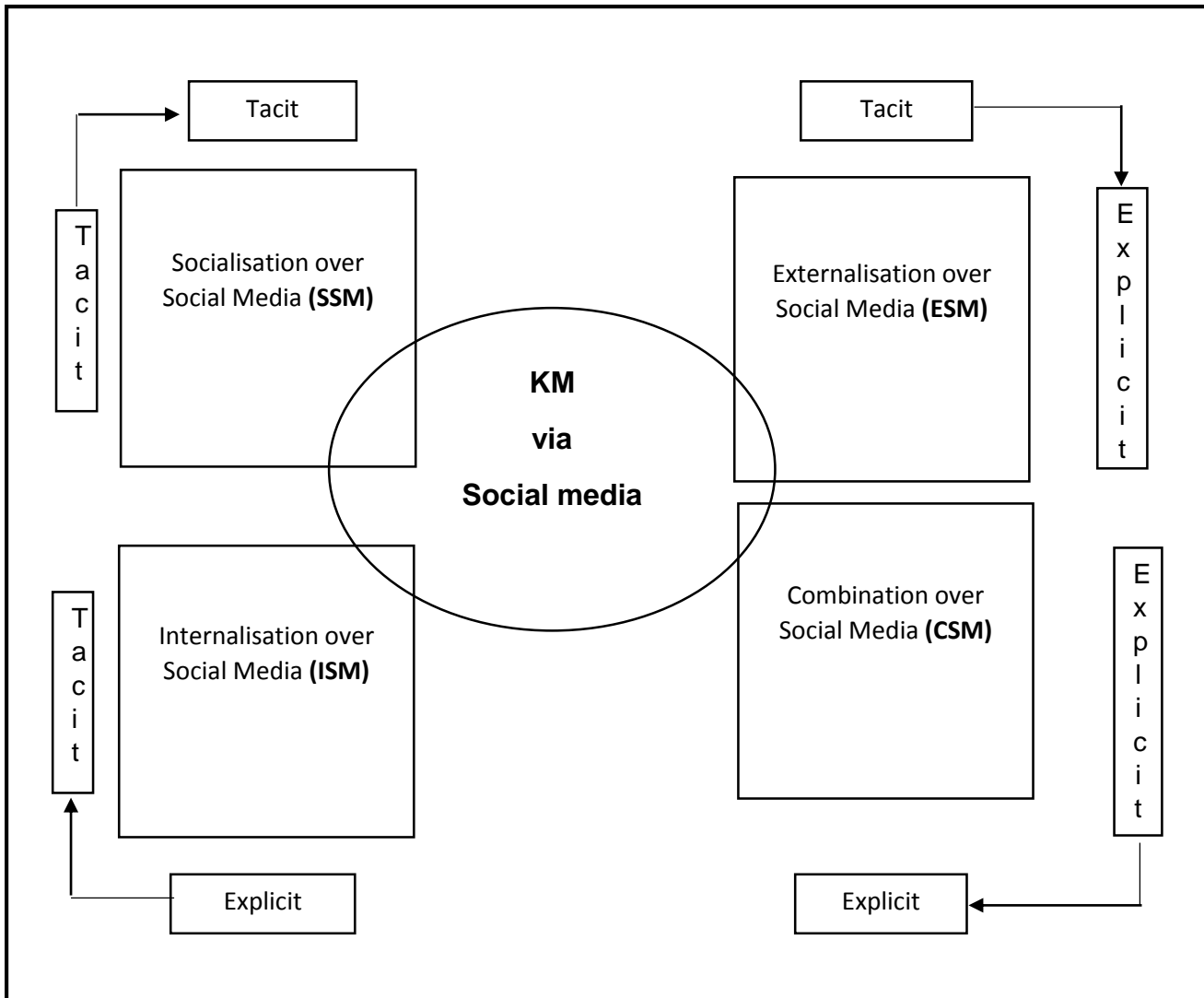
## **2.15 The significance of social media for KM**

Social media tools such as Facebook, LinkedIn and YouTube are vital for knowledge sharing in today's enterprises (Shah & Khan, 2013). These platforms allow people to contribute to a number of concerns and resolution of challenges associated with communication, collaboration and knowledge sharing. The most significant advantage of investing in social media is huge at a time where the phenomenon and practice is increasing and managers are actively involved in this collective enterprise. Workers have to get motivated to deploy these technologies for work purposes even though many establishments do not permit their staff members to use social media for security reasons.

Knowledge sharing is a mutual activity for almost everyone, but sharing knowledge within an institution is a very complex matter. According to Hernaez & Campos (2011), knowledge sharing is defined as a process by which knowledge inherent in an individual is transformed into a form that others can understand and interrogate. Thus, knowledge sharing entails the task of assisting others with knowledge, and cooperating with them to answer given problems. Social networks are some of the most innovative means of getting in touch with professionals and looking for new knowledge and horizons from external sources.

Knowledge sharing can be realised in written form by means of information systems. Enterprises and discrete organisations have to encourage the sharing of knowledge among their teams and if need be, the electronic spaces could be used for knowledge sharing purposes. Vuori (2011) describes social media taking into consideration the degree to which they support communication: social media offer platforms to share, discuss and express thoughts. They also include blogs, video sharing (YouTube), presentation sharing (Slide Share), instant messaging service (Skype), and wikis (Wikipedia).

Added together, it is apparent that social media has become an important platform contributing to knowledge sharing. This study developed ways in which such platforms could be integrated into the dynamics of developing KM systems at the selected universities and engineering sites identified in Namibia. Introduction of social media enhances knowledge creation and sharing. Redecker et al (2011) notes that social networking provides a learning opportunity for junior and less experienced staff and these researchers further add that social media allows senior and experienced employees to get recognition. Shah & Khan (2013) view social media as the heart of the SECI (Socialisation, Externalisation, Internalisation, Combination) model by Nonaka, Toyana & Hirata (2008), as more people socialise and share knowledge over the internet on a daily basis. Figure 2.4 on page 49 shows the integration of social media in effective KM.



**Figure 2.4: SECI – Social Media(SM) Model** (The role of Social Media in KM, 2013: 776)

Panahi, Watson & Partridge (2012), argue that social media should not be considered as a substitute to KM tools and techniques. The similarities between KM and social media is that both techniques use technology to access and share information (Bradley & McDonald, 2011). These researchers also found the differences between KM and social media in that KM is organisation-driven whereas social media is self-driven. Redecker et al (2011) reveals that junior staff easily acquire tacit knowledge through social media. It is therefore worth noting that there is a relationship between IT and KM.

## **2.16 Relationship between IT and KM**

According to Shah et al (2013), Information Technology facilitates knowledge transfer through e-learning and blended learning. The relationship between IT and KM is an essential consideration for any organisation wishing to manage its knowledge assets. It is generally known that IT provides a platform for communication and cooperation, message exchange and collaborative work, thus IT and KM work hand in hand to improve the effectiveness of an organisation. In KM, information technologies can be used for storing explicit knowledge in databases and knowledge repositories.

IT facilitates knowledge integration including data evaluation, analysis and aggregation. Gressgard et al (2014), add that ICT improves knowledge search and it greatly improves knowledge presentation. On the managerial aspect, it has been found that IT assists administrative functions of reporting of an organisation on a daily basis. Since KM focuses more on knowledge sharing through publications, it is therefore important for us to note that ICTs provide publication, structuring and linking tools. In addition, it is important to highlight here that IT can be tailored to assist specific organisational needs.

IT is a powerful tool for KM success and it facilitates knowledge sharing in organisations. KM practices are supported by ICTs that help facilitate knowledge creation, knowledge dissemination, knowledge conversion, and knowledge utilization (Cegarra-Navarro, 2014). The key role of new ICTs (Web 2.0 and 3.0, collaborative technologies, social networking tools, wikis, blogs) is to help people share knowledge. With appropriate training, new ICTs can make it easier for organisations to acquire, store and retain knowledge. Hansen et al (2014) conclude that ITs can increase efficiency of KM processes and they also highlight that the use of ITs for KM is based on principles of maximisation of accessibility and reliability.

The effectiveness of any KM initiative or effort should have some form of measurement. This measurement helps the decision-makers to make better decisions and identify areas which may require improvements so as to attain the organisational goals. KM experts need to show the real value of knowledge sharing in organisations (APQC, 2010). Metrics are quantitative measures used to gauge operational performance. The following sections discuss both the soft and hard metrics of KM in organisations.

## **2.17 Measuring the effectiveness of KM**

Other sources refer to metrics as key performance indicators, commonly abbreviated KPI (key performance indicators). The basis of organisational success is dependent on the actual management of an organisation's knowledge assets and there must be a way of assessing such organisational performance (Hoss & Schlussel, 2009). KM and specifically its performance measurement aspect has become an imperative task for many modern organisations. The metric performance should be compared to a benchmark. Not everything should be measured, but only important factors which boost productivity and innovation. Metrics are developed for continuous process improvement of KM undertakings.

Organisational culture should be considered when measuring the usefulness and the reporting technique to be used for measuring such effectiveness. Research has revealed that charts and statistics are good ways of reporting performance but these are not the end-all. One cannot assure that the selected tool of measurement will be the best for a given organisation.

According to the APQC (2010), KM metrics can be categorised into two (2) as:

- a) Hard metrics (Dollar saving measures)
- b) Soft metrics (Intangible measures)

Hard metrics measure profitability, money saved, time saved, number of errors avoided and products launched in an organisation during the specified period. Soft metrics on the other hand, focus on customer satisfaction, professional development, morale improvement, improved knowledge retention, enhanced innovation, trust and quick resolution to organisational problems. Customer satisfaction is regarded as the most reliable feedback because it provides an expressive and objective way of the customers' expectations and preferences. Thus, customer satisfaction is a baseline standard of performance measurement (Hayes, 2008) and therefore a critical one among key performance indicators.

Since KM is supported by appropriate technologies, there are measures which are used to monitor the effectiveness and responsiveness of a chosen technology and these are called "system metrics". In an online system, these metrics can measure the number of downloads, number of site accesses, dwell time per web page as well as frequency of use. On the other hand, the number of downloads does not mean that those downloads were read and the knowledge was transferred. System metrics are very important in KM as they could be used to assist in decision-making and other managerial functions including choosing the most appropriate strategy. It should be noted that metrics measured in this study contribute to organisational performance as stated in the objectives.

As discussed earlier on in the preceding sections that KM consists of people and technology, the section of KM which involves people is difficult to measure due to the cultural diversity and the range of tools used for knowledge sharing (Hoss & Schlusssel, 2009). It is difficult for a system to track the sharing culture and the only possible metric to measure this is a percentage of active members logged onto an organisational knowledge portal. In CoP, which are groups of people interacting regularly; the system can measure the number of unique visitors which is only useful if the percentage is high. A survey can be used to evaluate whether the community was helpful in meeting the objective in question and whether there was a quick resolution to a given problem. CoP have been found to be very helpful in realising the organisational mission (Wenger, 2014).

Through face-to-face meetings, the metric which can be used starts with the number of attendants. It is a challenge to know whether the knowledge exchanged during the meetings has improved organisational performance or not, but if knowledge is exchanged during face-to-face meetings it improves efficiency and leads to innovation (Hoss & Schlusssel, 2009).

The following metrics are considered to be helpful for organisational performance and were used in this study because they allow knowledge to be shared and used resulting in continuous improvement of KM activities.

- Adaptation to technological change.
- Customer satisfaction.
- Effective knowledge sharing and communication.
- Operational efficiency.
- Time saved as a result of knowledge sharing.
- Growth and enhancement in collaboration culture.

Mosconi & Roy (2013), state that one has to measure in order to efficiently manage knowledge resources. These researchers further add that effective KM could exist without the presence of clear and measurable indicators. So we may find that effective KM uses 'qualitative aspects' or no aspects at all, but this study used both qualitative and quantitative approaches. Since knowledge is transferred using various activities, it is important that we describe the various knowledge transfer activities used in organisations to boost organisational performance.

## **2.18 Knowledge transfer activities**

According to Lievre & Tang (2015) knowledge transfer activities helps employees to transfer expertise to others. The usefulness of knowledge transfer activities is necessary so that the best knowledge transfer activities can be selected and fixed into the organisational structures and processes. Knowledge transfer activities allow sharing of knowledge in organisations (Reiche, 2011). There are several knowledge transfer activities but this review only looked at those activities which might accelerate innovation, boost productivity and eventually change the organisations. These knowledge transfer activities are critically discussed in the following sections with their importance to improving organisational performance.

### **2.18.1 Communities of Practice**

According to McDonald & Cater-Steel (2016), a CoP is an approach where knowledge is transferred in an organisation either through formal or informal groups. Schiavove (2013) adds that CoPs can be formally established or can evolve spontaneously. Lesser & Everest (2011) states that CoPs provide access to new knowledge, generates new knowledge and encourages skills development. Membership penetration and growth are key items which should be analysed in a CoP to see how the community has grown (Jang & Ko, 2014). A knowledge transfer activity does not necessarily assess whether learning has occurred. Wenger (2014) adds that CoPs are a powerful manifestation of informal learning. CoPs are effective as they enable employees to manage change and this change clarifies the roles and responsibilities of individuals in organisations. CoPs can also foster trust and a sense of common purpose as they have the ability to link professionals for knowledge sharing on a large scale.

### **2.18.2 Succession Planning**

Succession planning is a process of identifying and developing employees to fill in key positions in an organisation (Durst & Wilhelm, 2012). These plans benefit organisations by making sure that the right people are in place at the right time. In addition, succession plans improve employees' ability to respond to changes in the workplace. Organisations face loss of intellectual property when employees retire from their jobs. Rothwell (2010), argues that KM within organisations is the heart of succession plans. He further stresses that knowledge transfer through succession plans represents a proactive step towards employee empowerment. This consequently avoids of loss of knowledge by the organisation. Succession plans are therefore an ongoing and dynamic process that focuses on the transfer of knowledge necessitated by an aging workforce.

### **2.18.3 Coaching**

Coaching is a widely used knowledge transfer activity in organisations. Coaching is therefore an important knowledge transfer tool which focuses on immediate problems and opportunities. Though other sources refer to coaching as a subset of mentoring, Abbot (2014), argues that coaching involves guiding the trainee on training in an effort to fuse operational knowledge which enhances performance. According to the Management Mentors (2015), the significance of coaching to the employee and the organisation is the perfection of employee performance that consequently lead to improved organisational performance. More so, coaching is needed in an organisation to maximise knowledge transfer, increase skill levels and for effective succession planning.

### **2.18.4 Storytelling**

Stuhlmann (2012) define storytelling as narratives that constitute operational knowledge. Research by Whyte & Classen (2012), proves that storytelling is a vital tool for transferring tacit knowledge allowing sharing of deeper knowledge which may boost organisations. An organisation which shares knowledge among its staff will eventually be transformed, since people are the key agents of such transformation. With proven benefits, Leblanc & Hogg (2010) argue that storytelling as a KM technique allows organisations discover tacit knowledge as it is a real natural learning process. Storytelling can be used to build a shared understanding which may provide for future vision.

### **2.18.5 Knowledge repositories**

Defined by Liebowitz (2012), knowledge repositories are on-line storehouses of expertise and documentation about a particular domain. Knowledge repositories can be considered as online self-help as they make it easy to find relevant information and resources. Su (2012), advises that organisations must develop means of documenting organisational knowledge. The transfer of knowledge through documentation has been viewed through the use of enablers like technology. The question of documenting corporate knowledge has been referred to as an approach that supports the transfer of knowledge amid changes in employee demographics and knowledge attrition (Liu, 2016). Relational databases and the Intranet are some of the technologies commonly used in building knowledge repositories for increased organisational efficiency.

### **2.18.6 Mentoring**

Mentoring provides professional socialisation and personal support to facilitate knowledge transfer in organisations. According to the Management Mentors (2015), mentoring is relationship oriented which is long-term and development driven. Mentoring in organisations is needed to maximise knowledge transfer and increase skill levels. The main aim of mentoring according to Rooney (2014) is to encourage the individual reflect on the job as a whole, so that current and new skills may be applied properly. Mentoring is also considered a vital tool for ensuring knowledge transfer from experienced staff to non-experienced employees (Young, 2013). In most modern organisations, mentoring creates a harmonious organisational culture which improves organisational performance.

### **2.18.7 Job rotation**

Job rotation is one of the oldest forms of knowledge transfer in organisations. Rotating staff enables effective and efficient transfer of operational knowledge (Katselli, 2008). Job rotation increases job satisfaction as workers get routinely exposed to various activities which might reduce physical and mental stress. Job rotation involves the deliberate movement of employees from one position to the other within the same organisation, each station entailing several distinct skills (Lu & Yang, 2015). Job rotation exposes workers to all verticals of the organisation. These rotations could be task rotation or position rotation and they are in themselves critical in providing skills across the departments.

### **2.18.8 Keenness to share knowledge**

Wang & Noe (2010) state that knowledge sharing is the basis of KM. Researchers like Stenius, Hankonen & Haukkala (2016), argue that the quality of motivation is important for experts to share or withhold knowledge. The passion to share by and among the employees is very important for improving organisational performance. Sharing knowledge generates new ideas, increases operational efficiency and helps employees to stay motivated.

### **2.18.9 Adaptability to organisational culture**

Organisational culture refers to a combination of shared histories, anticipations and social duties that compel productive behaviours in an organisation (Anderson, 2009). It is easy to implement knowledge sharing if an organisation has a knowledge sharing culture. Hassan & Al-Hakim (2012) defines culture as the norms and beliefs that direct the performance of an organisation's staff. Other sources like Cheung & Wong (2011) express that organisational culture is critical as a KM enabler. These knowledge transfer activities should be linked to a proper strategy which is aligned with the organisational objectives, making sure that what is transferred gets done and gets measured.



## **2.19 Strategies for implementing KM**

A strategy is a high level plan developed specifically for bringing about change and it requires executive support throughout (Margretta, 2011). It should be indicated from the beginning that there is no universal way to implementing effective KM as organisations have different structures. The KM strategy of an organisation is based on the best possible strategic design for creating, maintaining, transferring and applying organisational knowledge to reach the defined goals (Jennex & Smolnik, 2011). Modern business organisations have come to see knowledge as their most important strategic resource, one that has to be generated, preserved, shared and disseminated at the same time.

Most managers find it difficult to articulate the connection between their organisations' strategy and its knowledge resources (Schroeder, 2012). They lack powerful strategies that assist them link knowledge processes and technologies to a business strategy. Additionally, managers are not sure of how to transform the goal of making their organisations smarter into a strategic course of action. Organisations need a practical and sound model of what Zack (2007) calls a knowledge strategy. According to Zack (2007), the most significant context for guiding KM in an organisation is the organisation's strategy itself. Organisational needs should be identified first and should include the following:

- People and processes
- Technology
- Structure and culture

According to Simmons (2013), people represent the ability of individuals within the organisation to influence others with their knowledge. This entails interactivity and sound knowledge of both chores and innovations. Processes involve how one establishes best practices for the effective KM. Best practices are brought in to bear on the time scales an organisation takes to accomplish a set task, and therefore reach specific objectives that gel with strategy. Technology addresses how one chooses and utilises the tools to enable KM. Simmons (2013) further states that structure implies how to transform organisational structures to facilitate cross-discipline awareness and expertise. Additionally, culture represents how to establish and cultivate a knowledge-sharing and knowledge-driven culture.

In organisations, executives should develop a framework that connects specific KM strategies with specific challenges faced, eventually tapping into the cross-discipline expertise of the workforce. Firms need to perform a knowledge-based SWOT analysis so that they can map their knowledge resources and competencies against their strategic opportunities and threats to understand their specific advantages and weaknesses. The map developed could then be used to guide their KM efforts in an organisation.

Skinner (2008) suggests that the KM strategic plan must have the following elements:

- Objectives and approach
- Plan and budget
- Cost benefit analysis
- People, processes and technology
- Measurements

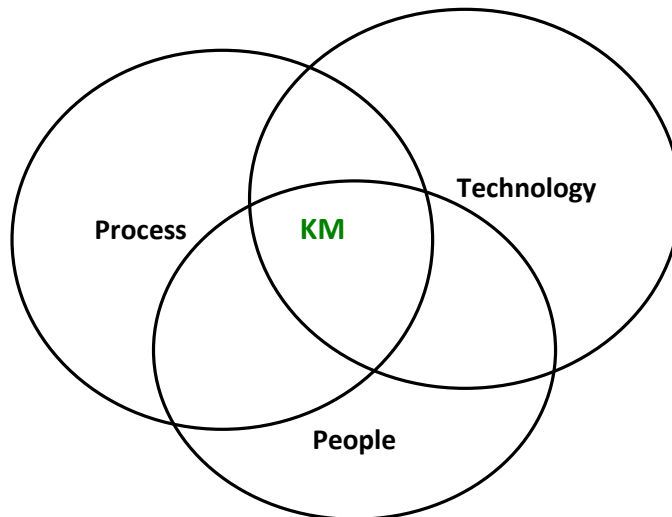
Steiner (2010) in his step-by-step guide for strategic planning defines objectives as specific measurable results of an initiative. He adds that an organisation's objectives offer specifics of how much of what will be accomplished when. There are several approaches to strategic planning and one approach is to start with the analysis of the current state of the organisation, including its strengths and weaknesses as well as the business environment. A budget is essential to support all strategic plans. Cost benefit analysis on the other hand involves adding up the benefits of a course of action, and then comparing them with the costs associated with it. In the same view, measurements and indicators help to measure and monitor progress of a strategic plan.

According to Skinner (2008), the initial step in developing a KM strategy is the identification of a leader within the organisation. In many contemporary organisations someone is appointed at board level as a Chief Knowledge Officer (CKO). The CKO would be accountable for guiding the strategy and assisting in developing a knowledge sharing culture among the staff members. A KM strategy should incorporate and ensure availability of technology to assist in the efforts of knowledge storage and transfer (Skinner, 2008).

The strategy for implementing KM by Simmons (2013) has 8 steps as listed below:

- a) Establishing KM programme objectives
- b) Preparing for change
- c) Defining high-level processes
- d) Determining and prioritising technology needs
- e) Assessing the current state
- f) Building a KM implementation roadmap
- g) Implementation
- h) Measuring and improving the KM programme

Strategies for implementing KM differ from one organisation to another because of different organisational structures, culture, technology used and the processes involved. Strategic plans are very vital if an organisation wishes to boost its productivity and remain competitive. Figure 2.5 below extracted from Neilson (2008) shows the main tenets of KM which play an important part in the organisational transformation process.



**Figure 2.5: Main tenets of KM (Neilson, 2008)**

KM needs to study the three elements of people, processes and technology (Edwards, 2011). Culture & Workforce Dynamics (2012) highlights that people share what they think others need to know and they further stress that a high level of trust is essential when sharing knowledge. According to Liu (2016), people implement organisational changes to enable a knowledge sharing culture. Literature has revealed that KM is composed of 80% people and 20% technology (Girard & Girard, 2015), thus the people must be motivated to share what they know. People with high technical skills are very innovative and are needed in most organisations.

The process component of KM develops consistency in core business processes, understanding gaps and using best practices to build the best breed of processes. Edwards (2011) stresses that the process component of KM develops policies, maps, workflows, integration, best practices and business intelligence standards. Neilson (2008) extrapolates that the technology component addresses the knowledge capture and retrieval systems which also integrates systems with existing knowledge stores. Technology is an enabler to KM and it includes networks, internet, databases, data mining, decision tools and automation standards. Organisational change is possible when these three components of people, process and technology are studied in detail and integrated in such a way that their combination boosts organisational productivity (Al-Bastaki & Shajera, 2013).

## 2.20 Organisational transformation

KM is the beginning of organisational transformation (Randy, 2013). An organisation can only be transformed into an effective enterprise if it first understands the meaning of KM in its own context. According to Sharma (2012), organisational transformation occurs in response to changes in the organisation's environment and or technology. Sharma (2012) extends that organisational transformation is usually a top-down approach which is top-management driven. Organisations are having a tough time maintaining their customer satisfaction goals (Hill & Allen, 2007), as the competition increases every day. Satisfied customers will continuously help organisations with repeat business and extension of contracts. In addition, satisfied customers spread the efficiency of an organisation by word of mouth in the industry, thus providing organisations with leads to getting new customers.

Ensuring the best in customer satisfaction, organisations are considering KM to support them leverage their intellectual property. KM has been defined by Serrat (2009) as a practice to identify, capture, share, reuse and innovate effectively by utilising organisational experiences. As organisations started realising that KM is becoming a key factor in the strategy to stay competitive, many organisations tried to implement it with mixed results. Most companies failed in the past when they approached KM as a technology implementation framework (Liu, 2016). It has been revealed that technology is just an enabler in KM; the key element is the people who make the workforce and organisations need to address people's needs, fears and concerns.

Addressing people's needs, fears and concerns takes us to the debate regarding Change Management. Hiatt & Creasey (2014) argue that any KM solution that does not have a strong Change Management strategy is destined to failure. This definitely means that Change Management must be a key element of any KM strategy. KM is about transforming an organisation's perspective about knowledge and how to leverage organisational intellectual property (Randy, 2013). Change is all about people and people being social creatures driven by beliefs and behaviours, they are often resistant to accept new practices and behaviours. Bremer (2012) proposes that having transformational change, organisations should entrench their desired beliefs and behaviours at every organisational level. A well-managed change will have a positive impact on the organisation.

An organisational change can be in many different categories such as:

- Strategic and structural changes
- Technological and operational changes

Strategic changes encompass changes to the general goals and purposes of an organisation (Beitler, 2013). Structural changes refer to changes made to the organisation's structure that might stem from internal and external factors. Beitler (2013) extends that structural changes may include things such as the organisation's hierarchy, administrative procedures and chain of command. Globalisation leads to technological changes which eventually lead to operational changes all directed at improving organisational performance.

Change Management is therefore a strategy to transform an organisation from current state to a desired future state in order to meet changing business needs. Bevan (2011) stresses that Change Management is very critical for KM. Some organisational changes may involve some of the above-mentioned change categories but KM includes all the four categories, which is why it is very important to have a complete Change Management strategy. It is well-known that knowledge is held by individuals and individuals form organisations as shown in **Figure 2.6** below.



**Figure 2.6: Individual, Team, Organisation**

For an organisation to change individuals who are part of the organisation, the focus should be on behavioural change. An effective change management strategy should address the individual's behavioural aspects to motivate them adopt change for a better future. In the past, individuals and organisations were of the idea that "knowledge is power", so they would hoard knowledge so that they were the most valuable 'knowers' in the organisations. With the introduction of KM tools and technologies, this perception has been changed to "knowledge sharing is power", meaning that the more you share, the more others will reciprocate, and together as an organisation, you know more.

## 2.21 Change Management Strategies

The approach for successfully implementing change by Randy (2013) has 5 steps, namely:

- Assessment
- Strategy
- Build
- Implement
- Evolve

**Assessment** in Change Management entails understanding the organisational culture in detail. This allows understanding the need for change and the opportunity that it brings to the organisation. **Strategy** allows for the creation of a Change Management plan and vision by answering the important questions about change (McCalman, Paton & Siebert, 2015). The questions may include the following. What do we need to achieve? How do we initiate change? When such questions have been meaningfully answered, then the roles of all people participating in Change Management should be clearly defined according to the organisational objectives.

Randy (2013) extrapolates that **Build** permits creating a Change Management plan involving all the key stakeholders who will be impacted upon by the change. A communication plan that provides details about communication channels, frequency of communication and reports should be developed. **Implementing** the changes is based on the strategy and the Change Management plan defined. All the stakeholders should be kept focused on the vision and the progress should be monitored, keeping the feedback channel open to learn about resistance. The ultimate **Evolve** step allows reviewing results and learning in order to make necessary adjustments to meet the objectives.

According to Sharma (2012), change should be embedded into the organisational culture. Any organisational change will either have a positive or negative change cycle, depending on the organisational culture and the change strategy the organisation adopts. If people look at change as an opportunity to get better and it has the right strategies to address the change requirements, then the organisation will experience a positive change cycle. On the other hand, if people in the organisation resist change and think of it as a threat, then the organisation goes through the negative change cycle or the grief cycle as commonly used in the change management literature. Avoiding the negative change cycle requires organisations to have best practices for guidance through the change process (Randy, 2013).

An organisation which is transformed has best practices, shares knowledge among co-workers and makes use of the best tools and technologies for its operations (Zheng et al, 2010). A transformed organisation has a sharing culture embedded into the organisational structures and processes. People are key agents for successful organisational transformation. If an organisation addresses all or most of the following points and ideas in its operations, then it will be eventually transformed and will be KM aware in this globally-competitive environment (Massini et al, 2010; Peet, 2012; Martins & Meyer, 2012; Harvey, 2012; Frost 2014; Omotayo, 2015; Lievre & Tong, 2015; Girard & Girard, 2015). In the literature, Liu (2016) suggests the following for organisational transformation:

- Motivate employees to share knowledge.
- Take initiatives to share knowledge and use right tools to manage knowledge.
- Align IT with KM and engage management to support the KM efforts.
- Retain expertise of employees creating room to learn from each other.
- Remove KM barriers especially, resistance to change.
- Make use of best practices and implement lessons learnt rather than just identifying them.
- Create CoP to share knowledge and continuously brainstorm.
- Create and promote a knowledge sharing culture and embed it into the organisational structure.
- Create physical and virtual workspaces that enable knowledge sharing.
- Make use of the right strategies aligned with organisational objectives.

The effectiveness of KM results in fewer mistakes and adaptation to changed environments (Mosconi & Roy, 2013). Effective KM means performing the most suitable processes and making the best possible decisions in a timely manner. Efficiency means performing the KM processes quickly in a low-cost fashion. Innovation permits performing the KM processes in a creative and novel fashion that improves efficiency. Incorporating all these processes and practices results in complete organisational transformation (Rasula et. al, 2012).

## **2.22 Summary**

This chapter provided a review of KM in general as well as how it is applied to and within organisations. KM processes and systems were discussed in detail together with their relevance to this particular study. It has been revealed that there is no generally accepted definition of KM though most practitioners agree that KM treats both tacit and explicit knowledge with the objective of value-addition to the organisation. Each organisation defines KM in terms of its business objectives where the tools and technologies to support KM were identified and discussed together with their applicability in this study. The chapter also discussed the barriers to effective KM as well as the critical success factors for effective KM. Motivational factors to share knowledge were thoroughly discussed as well as the relationship between IT and KM. The chapter concluded with the organisational transformation process and the Change Management strategies. The next chapter discusses the methodology used to conduct this study.



## **CHAPTER THREE - RESEARCH DESIGN AND METHODOLOGY**

### **3. Research design and methodology**

Research requires an organised approach in order to achieve the objectives of the enquiry and investigation (Leedy & Ormrod, 2010). Chapter 2 discussed literature on KM practices and its value in knowledge-intensive organisations. The research design section in this chapter describes how the investigation was done. This segment is very critical for indicating that the researcher has developed an organised and thoughtful study design. The reason for embarking on a research project is to systematically find a solution to a problem (Ngulube, 2015).

#### **3.1 Introduction**

This chapter outlines the methodology used to answer the following main research question:

##### **Main research question**

How can Knowledge Management through knowledge sharing and knowledge transfer, contribute to more effective organisational transformation in Namibian knowledge-intensive organisations?

##### **Sub-questions**

- a) What does Knowledge Management mean in knowledge-intensive organisations?
- b) What mechanisms can be introduced to enable and facilitate knowledge sharing in knowledge-intensive organisations?
- c) What are the barriers that impact on Knowledge Management (knowledge sharing and knowledge transfer)?
- d) How can people be motivated to improve knowledge sharing and transfer?
- e) How can Knowledge Management tools and technologies (particularly social media tools and technologies) support knowledge sharing and transfer?

The chapter also discusses the research paradigm, design, research sites and the participants. In addition to the participants, the chapter also discusses and validates the instruments used for data collection and their advantages and suitability for this specific study. The production of valid and reliable results is dependent upon the research methodology used. Ngulube (2015) states that the users of research products have the right to know how the study was conducted. It is therefore important at this point that the researcher acknowledges the right stated here and explain how this research was carried out. This chapter also discusses ethical considerations which the researcher abides with.

### **3.1.1 Research paradigm**

A research paradigm is a “worldview” or a set of assumptions about how things work (Creswell, 2009). The positivist paradigm was used in this research because it is scientific, objective and robust. Literature on research design by Leedy & Ormrod (2010) shows that the positivist paradigm uses the technique applicable to and derived from the natural sciences. Paradigms can be considered by their ontology, epistemology and methodology. On one hand, ontology refers to what already exists in terms of views about the nature of reality whereas epistemology is our perceived relationship with the knowledge we are realising. Denzin & Lincoln (2007), define methodology as a set of rules from which methods are derived in order to solve a problem within the scope of a specific subject and discipline.

Creswell (2009) defines a paradigm as the shared understandings of reality and it is also evident that research paradigms involve ontological, epistemological and methodological issues. According to Sarantakos (2013), the choice of a research methodology is determined by the “underlying theoretical paradigm”, research question and research purpose. The research questions determine the methodology that should be used to understand the reality pertaining to a specific phenomenon. Positivist epistemologies and quantitative approaches have dominated research undertakings in Knowledge Management (Ngulube, 2015) and this study followed the established pathways for investigating Knowledge Management practices in Namibian knowledge-intensive organisations.

The research focus was on KM and its effectiveness for organisational transformation through knowledge sharing and transfer, taking into consideration the organisational factors, available technology and the intellectual assets. The positivist paradigm has been significantly powerful in management research (Tubey et al, 2015) and hence this study used a positivist approach. By adopting a positivist paradigm, this research conducted an empirical investigation involving original data collection for analysis using interviews and questionnaires. A positivist paradigm counts on the principle that truth exists firmly independent of the observer and reality is co-constructed from the individual who observes it within a specific context.

This co-construction of knowledge taps into the sociology of knowledge where reality itself is socially constructed. Society develops knowledge through individuals who share what they know and confirm such knowledge when the individual applies this epistemic version in resolving the challenges of their world.

### **3.1.2 Research design**

The study employed a quantitative research method in a bid to confirm the characteristics and patterns of the phenomenon under investigation. The researcher also used interviews to verify and validate the quantitative findings. The methodology combined mostly quantitative and qualitative data in one study as described by Gay, Mills & Airasian (2012). The triangulation mixed methods design is also known as the QUAN-QUAL model. The most significant benefit of this technique is that the strengths of qualitative data offset the weaknesses of the quantitative data and the strengths of the quantitative data offset the weaknesses of the qualitative data (Gay et al, 2012: 463). Thus, such triangulation approaches required the researcher to value the quantitative and qualitative data collected to determine their relative strengths in response to the research questions set at the onset.

Research strategy refers to the method that helps the researcher to study the research problem and the questions set at the beginning. Lee & Cronin (2016) describe a strategy as a general plan that aids the researcher in answering specific research questions. The researchers add that an effective strategy incorporates clear objectives, identifies the data collection instruments and specifies the constraints that could affect the research such as resource and time constraints. Denzin & Lincoln (2007) define a strategy as the general approach to answering a given research question.

In the case of KM topic on which this study was based, surveys identified representative samples from which data was collected and analysed to answer the questions. The survey strategy was the most appropriate for the research problem defined as it permitted significantly large volumes of data to be gathered from a range of participants within a short space of time in a reasonably cost-effective way. The study used questionnaires and interviews to gather data. Surveys offer honest responses compared to other strategies like action research. Many variables were effectively analysed ensuring that precise results are achieved. The adoption of the survey technique in this research was appropriate because of its ability to compare, contrast and interpret findings. These aspects of the survey technique addressed the current levels of Knowledge Management, KM implementation and how KM is used to enhance organisational effectiveness in the Namibian/African context.

The quantitative data collected was analysed and interpreted for different stakeholders. The merits of this approach stem from the fact that words, pictures and narratives were used to add value and meaning to plain quantifying numbers. The same quantifying numbers were used to add precision to the words, pictures and narratives. This allowed the researcher to offer a broader and more complete range of empirical answers to the research questions because he was not confined to a single approach. The generalisability facet of this research was increased as qualitative and quantitative approaches were used together to produce more complete and robust results.

Hernon & Schwartz (2009) elaborate that when setting up a study, it is necessary to review the research identified in the literature and determine whether or not there are substantially relevant findings and pointers connected to the research design. The research design is an action plan that covers:

- The population being studied,
- The different types of designs,
- The time frame for data collection and
- The threats to reliability and validity.

The quantitative and qualitative approaches are discussed separately on page 68 and page 69 respectively in relation to this particular study on KM. Research work calls for a specific plan, showing how one intends to proceed with the study (Leedy & Ormrod, 2010: 3). The qualitative and quantitative methods provide complementary results because qualitative research is highly descriptive in nature while the quantitative method provides accurate data for analysis and full utilisation.

### 3.1.3 Quantitative approach

According to Ngulube (2015), quantitative research gives valid and objective descriptions of a particular phenomenon and therefore the quantitative component in this study entailed collecting data from the research respondents using a structured questionnaire (**Appendix 2**). The study analysed the collected responses to determine the level of awareness of KM among the participants in selected institutions in Namibia. The study further analysed the challenges faced by knowledge creators with regard to ICTs in performing the KM activities at the respondents' specific sites. The investigation further looked at the correlation between IT and KM. This correlation was determined using Pearson's coefficient of correlation which is a measure of the strength of a linear association between two variables. The association between the variables emerged as positively strong.

The study collected quantifiable scores from the participants which were analysed using both descriptive and inferential statistics. The initiatives for enabling knowledge sharing activities in organisations were also collected and analysed in a quantitative manner. The tools and technologies used for effective KM were also quantified using descriptive statistics and the researcher strove to maintain objectivity by not permitting personal biases to influence the analysis and interpretation. Rating scales were used to standardise the responses, making it easy to categorise the analysed data.

The quantitative approach is objective as opposed to the qualitative approach which is subjective (Creswell, 2012). The approach takes less time to conduct and can be easily replicated in similar contexts, a strength observed by many researchers like Denzin & Lincoln (2007); Leedy & Ormrod (2010) and Gay et al, (2012). The quantitative approach has its other strengths in statistical techniques, allowing sophisticated analyses and inferences with a high degree of precision and reliability measurement. This approach allowed the researcher to quantify opinions and views of different participants and to generalise the results. The researcher had to blend the quantitative approach with the qualitative one to generate quality deductions from the submissions of the respondents.

### 3.1.4 Qualitative approach

According to Yin (2016), qualitative research involves the collection, analysis and interpretation of narratives from participants to gain an insight into a particular subject. Multiple forms of data collection are used in a qualitative study, and in this case the interviews (**Appendix 3**) and meetings were used, aimed at eliciting and understanding the experiences and attitudes of participants towards KM. Observations and interviews are described by Leedy & Ormrod (2010) as excellent instruments for data gathering through qualitative means. The researcher elicited the different views of participants, specifically the HODs and managers because all KM efforts require executive support from such personnel. The data collected using interviews relies largely on the words and statements of the participants with less or no bias since their views are presented in their own unedited words (Creswell, 2012). Such thick descriptions give voice to the research participants, equally making their views an important contribution to how they perceive their worlds.

The data collection started with background questions on the fundamental aspects of KM which gave an insight into whether or not the participants were aware of the activities involved, allowing sufficiently deep observation of the processes. This qualitative component involved narrative description of the submissions of the respondents. The qualitative component also analysed the initiatives and motivational factors used for effective KM. Additionally, the qualitative component analysed the barriers which hinder KM implementation in specific organisations. The effectiveness of KM was further analysed using the various social media available as well as the IT tools and techniques and therefore the approach was incorporated into this study to bolster the quantitative findings.

Apart from the fact described by Leedy & Ormrod (2010) that qualitative research provides a broader understanding of the participants' views, Creswell (2012) observes that data analysis is time-consuming and results may be influenced by the researcher's biases. The researcher therefore opted to combine the two approaches so that sound and valid results were produced. The use of more than one approach enhances and extends understanding of KM (Ngulube, 2015: 125). Ngulube further adds that knowledge used in any scientific field is dependent on the methodology that has been used. Maxwell (2013) advocates that qualitative research works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalization of variables.

This section describes the sites where the study took place and the associated research participants. The section also justifies the choice of the sites and the participants. The section additionally discusses the sampling frame applicable together with full justification for this frame.

The study was conducted in Oshana region of Namibia. The reason for choosing Oshana region out of the 14 regions of Namibia is the proximity to the researcher's duty station. The following map of Namibia shows where the study took place.



### **3.2.2 Research participants**

A research participant is a person who participates in research by being the target of observation by researchers (Lorna & Coleman, 2010). A research participant has the right to know why the research is done and the risks that may occur. Participants also have rights to ask questions or drop out at any time without penalty. They also have the right to know whom to contact when they have questions or concerns. Most importantly, participants have the right to know and understand how their private personal information is to be kept, used, and disseminated.

#### **3.2.2.1 Population**

The participants to this research were selected from the following institutions:

- a) University of Namibia's Faculty of Education, Engineering & IT,
- b) The International University of Management,
- c) Consulting Services Africa,
- d) Conselect Consulting Engineers and
- e) Ongwediva Consulting Engineers.

The research sought to establish and understand the different views of purposefully selected university lecturers and engineers in relation to their conceptualisations of KM. These universities in Namibia are regarded as centres for knowledge creation and graduates from such institutions often find work in engineering consulting firms where KM plays a pivotal role in the daily operations of these organisations. The universities studied were state-owned and some were privately-owned in Namibia. The institutions identified were investigated and visited on a regular basis within the limitations of constrained time and financial resources.



### 3.2.2.2 Sample size

The sample of this study was comprised of 112 participants from the knowledge-intensive organisations (universities and consulting engineering firms). According to the Research Advisors (2007), a sample of above 100 participants has a 5% margin of error if tested at 95% confidence level. Therefore, a common rule of thumb is a 95% confidence level so that the emergent results are accurate and that was the rationale adopted in the execution of this study. The researcher used purposive sampling, which, according to Leedy & Ormrod (2010), is determined by “the judgment of the researcher as to who can provide the best information to achieve the objectives of the study.” The researcher identified potential participants who have characteristics deemed suitable for providing the required information on KM practices.

Onwuegbuzie & Collins (2007) suggest that the sample size should be informed by the research objectives, research questions and the research design. According to Research Advisors (2007), the sample size is determined by three factors:

- a) Level of statistical confidence with which the researcher wants to test the results.
- b) Degree of accuracy that the researcher requires to estimate the population parameters.
- c) Estimated level of variation with respect to the main variables being studied.

Creswell & Plano-Clark (2007: 113) suggest that “if the quantitative research study is a survey, sampling error formulas can help identify the appropriate size for the sample.” In general, social science researchers are convinced that if the population is large, the sample also has to be large but according to Ngulube (2015) and O’Sullivan et al (2008), this is not necessarily correct, indicating that perspectives on the precise sample size differ even amongst established researchers.

Studying the sample permits drawing of valid conclusions about the larger group (Ngulube 2015). Sample size entails the number of participants chosen from the entire population and in the literature on sampling, researchers like Leedy & Ormrod (2010) propose a sample size of 50% of the population. O’Sullivan et al (2008:155) point out that “one misconception about sample size is that a sample must include some minimum proportion of the population.” This suggests that if the size of the population is big, the sample size must also be increased. In actual fact, the main factors that determine sample size are the desired degree of accuracy and the confidence level.

### **3.3 Data Collection instruments**

For this study, two (2) instruments were used and these are listed and described below:

- a) Questionnaires and
- b) Interviews

#### **3.3.1 Questionnaire**

A questionnaire is a standard document that contains instructions and questions which are compiled to obtain answers from the participants. The questions are presented with exactly the same wording and in the same order to all the participants (Brace, 2013). Questionnaires and surveys are sometimes perceived as having the same meaning though Powell & Connaway (2010) states that a survey is a group of research methods commonly used to determine the present status of a given phenomenon. A questionnaire is simply a data collection instrument, oftentimes deployed by the researcher to collect general views of people in such a way that the sample identified provides an insight into the patterns and attributes of the entire population.

The researcher used hardcopy questionnaires to collect data. The guidelines provided by Leedy & Ormrod (2010) were followed in designing the questionnaire, thus the questionnaire was kept short, simple and clear. The questionnaire was pretested amongst 10 participants to make sure that the questions worked as intended and were all well understood by the participants. Several iterations took place during the questionnaire construction and pretesting before the adoption of the final version in Appendix 2. The advantages of using questionnaires in this study were:

- Questionnaires offered a widespread and comprehensive coverage of people such that the results were demonstrative of the broader population.
- Questionnaires produced volumes of data in a very short space of time at a reasonable cost. The associated costs and time were reasonably predicted in advance, helping the researcher significantly in the planning and project management.
- Questionnaires had a very high degree of respondents' anonymity. All the data obtained from the participants in this study was kept confidentially and names of all research participants were not divulged. As a security measure, hard copies of the questionnaire were kept in a lockable drawer.

Just like any other data gathering tool used in research, the disadvantages of using a questionnaire in this study were noted. These disadvantages are listed below in point form:

- Questionnaires could not tell us about content and meaning behind a response.
- It was difficult to tell how truthful the participant was being.
- There was absence of explanations to some questions.
- Participants may have understood the questions differently based on their individual interpretation.
- Questionnaires might have had missing important information because of the researcher's imposition during development.

### **3.3.2 Interviews**

A total of eleven (11) interviews were held to collect qualitative data from the participants, specifically the HODs and managers during the months of March and April 2017. Six (6) interviews were held with HODs for Electrical Engineering, Civil Engineering, Structural Engineering, Information Technology, Languages and Telecommunications of the UNAM campuses. Two (2) interviews were held at IUM, a private university, with the Centre Head and the HOD for Business Studies. In addition, three (3) interviews were held with managers of the three consulting firms namely Consulting Services Africa, Conselect Consulting Engineers and the Ongwediva Consulting Engineers. These interviews took approximately 30 minutes to complete. According to King & Horrocks (2010) an interview is a one-on-one verbal interaction between the interviewer and the interviewee. Interviews were favoured for data collection for the following advantages:

- A lot of in-depth information was obtained as there was personal interaction and the interviewer could probe for more facts and information.
- Personal interviews helped the researcher to measure what the participant knew by mere observation.
- Clarity of questions was achieved since the study involved dialogue between the researcher and the interviewee.
- Samples could be easily controlled effectively as there were no problems of missing answers.
- The interviewer could control the interview and purposefully selected participants were chosen to answer the questions.

### **3.4 Quantitative data collection**

The researcher administered 130 questionnaires (**Appendix 2**) to collect data from the research participants. The questionnaire was developed following Leedy & Ormrod (2010) guidelines which state that a questionnaire must be clear, short and simple. The questions were structured and grouped into two categories namely the open-ended and closed questions to answer the research questions defined. The questions had the same wording in the same order for all the respondents (Brace, 2013). The questionnaire was pretested before it was administered. Questionnaires were distributed to lecturers and senior staff at universities and engineering firms after short meetings and presentations by the researcher.

The questionnaires focused on technical issues of the project in a standardised format ensuring that the data and information collected was accurate so as to generate correct and valid results which answer the research questions. Questionnaire responses were validated using Cronbach's Alpha as explained on section 3.1 on page 80. Quantitative data collection involved the use of numbers to collate information related to KM mechanisms. The quantitative data collection instrument gathered information in different sections ranging from tools and technologies for KM up to the knowledge transfer activities practiced within the specific organisations.

The collected data was then analysed using statistical tools (SPSS and Excel) which offered the researcher an opportunity to scan deeper into the data and look for patterns and themes in the meanings. Statistical Package for Social Science (SPSS) is a Windows-based application programme used to perform data entry, data analysis, create tables and various graphs. Both SPSS and Excel offer complete plotting, reporting and presentation features. Such an analysis proved relevant by permitting the researcher to draw meaningful conclusions.

### **3.5 Qualitative data collection**

On the other hand, eleven (11) interviews (**Appendix 3**) were conducted with senior staff members incorporating heads of departments (HOD) at the Namibian universities. King & Horrocks (2010), describe an interview as a process involving one-on-one verbal interaction between the interviewer and the interviewee. The interviewer's role is to ask pertinent questions and the interviewee's role is to respond to the questions asked. These interviews with management were vital because all Knowledge Management efforts require executive support as evident in the literature review segment of this report. Interviews were conducted to see how knowledge sharing could be encouraged so that the goals of KM could be actualised and realised at their respective institutions.

### **3.6 Quantitative data analysis**

According to Ngulube (2015), data analysis relates to what is done with the data collected from the research process in order to make sense out of it. The quantitative data analysis was done using SPSS and Microsoft Office Excel 2013. The choice of these packages was motivated by their user-friendliness and the possibilities provided for generating charts and other graphic representations. These different charting capabilities like bar graphs, pivotal tables and pie charts allowed the researcher to display different dimensions of data in a convenient format. SPSS enabled the researcher to score and analyse quantitative data in a very short space of time.

Because quantitative techniques generate a lot of numbers, they need to be described, analysed and summarised. Characteristics of the data may be described by graphs, charts and cross tabulations as stated by Lacey & Luff (2009). Data collected using the structured questionnaire was analysed using descriptive and inferential statistics. Babbie et al. (2010) refer to descriptive statistics as a method of presenting data in a manageable form. Quantitative data analysis involves aspects such as the frequencies of variables and differences between a set of variables. The relationship between IT and KM variables were analysed using Pearson's product moment correlation.

Frequency count distributions and graphical representations of data in the form of tables, histograms and pie-charts were used in this study for the purposes of analysing responses provided through the questionnaires. Furthermore, measuring the effectiveness of the knowledge transfer activities could not be achieved without descriptive statistics. These statistics are fully presented in chapter 4 of this research report.

### **3.7 Qualitative data analysis**

The researcher took notes and recorded all the interview sessions with all the 11 interviewees. This note-taking was undertaken to ensure a complete capture of all the discussions. The hand written notes were then transcribed using Microsoft Word ® computer application software. Transcribing the spoken words started by reading the transcripts followed by labelling the relevant pieces of information commonly known as “coding”. The researcher then decided which codes were important and recurrent, considering the number of repetitions and similarities in what has been published in previous local and international journal articles.

In order to identify the themes, content analysis was applied where the researcher read all the eleven (11) transcripts. Content analysis is done to identify keywords and emergent themes and it allows extraction of detailed, rich and complex data accounts from the interviews. The labels which were found relevant by the researcher were: awareness, challenges, initiatives, motivation, barriers and effectiveness. Hancock (2012: 76) clarifies that:

The process of content analysis involves revisiting the data and reviewing the categorisation until the researcher is sure that the themes and categories used to describe the findings are a truthful reflection of the data.

The use of Microsoft Word® simplified the grouping of similar themes together. This was done by simply copying and pasting related themes after which the researcher analysed the data. The data analysis applied was only limited to Microsoft Word. Specialised qualitative data analysis software such as MAXQDA, QDA Miner or Transana were not used because the researcher did not have a fully licenced version of the software with full functionality. The free software for qualitative data analysis had limitations in terms of the text items they could analyse and could not be utilised optimally in this analysis.

According to Saunders (2009: 414), the qualitative data analysis should present the researcher with a different set of procedures which reflect the philosophical assumptions which underpin the aims and approach to qualitative research. Creswell (2009: 218) advises that qualitative data analysis involves creating codes and themes, and then counting the number of times they occur in the text data using the content analysis. The themes and patterns emerging from interviews were grouped together and this simplified the data analysis.

### **3.8 Validity of instruments**

According to Leedy & Ormrod (2010), validity of a research instrument is the extent to which it measures what it is intended to measure. Validity takes different forms, each of which is important in different situations. Validity in research means that an appropriate process is followed and the results of the investigation come from the empirical data collected. In this case of assessing the effectiveness of KM in organisations, validity had an important role to play making sure that the outcome is trustworthy. The research methods used helped the researcher to guarantee validity insofar as the data sets were from the research participants identified.

Validity finds its roots in the positivist approach, and as was described in the preceding sections, this study collected empirical data from the sites and participants engaged. According to Gay, Mills & Airasian (2012), the measuring instruments used to gather the data must be valid and reliable for the interpretation of data to be meaningful. Babbie et al. (2010: 122), define validity as an empirical measure that reflects the meaning of a concept under consideration. In actual fact, the instruments were intended to measure certain attributes of KM. A combination of quantitative and qualitative methods ensured that the instruments were valid. Using several data collection instruments boosts the instruments validity (Babbie, 2010). That is why questionnaires and interviews were used in tandem. The following sections discuss how the validity of the data collection instruments was ensured.

#### **3.8.1 Content validity of the questionnaire**

Triangulation was used to validate the questionnaire, ensuring that data was obtained from multiple sources. McMillan & Schumacher (2014) refer to this form of validity as “convergent validity”. Before adaptation and distribution, the questionnaire was standardised to make sure that each section addressed one objective and answered one research question. This tentatively ensured that each question in the entire questionnaire responded to each of the research questions. Responses were compared to a data analysis protocol for purposes of data relevance and consistency.

#### **3.8.2 Content validity of the interviews**

Interviews were carried out after the questionnaires had already been administered. All interview questions were open-ended so as to amass sufficient quality and relevant information. The way that data is collected and evaluated has a significant impact on the validity (Leedy & Ormrod, 2010). In an effort to ensure that valid and sound responses were obtained, the research participants were also given time to ask questions for further clarity on areas which were not quite clear.

### **3.9 Reliability of instruments**

Reliability means dependability of the measuring instruments and it measures the degree to which an instrument reliably measures what it purports to measure (Leedy & Ormrod, 2010). Reliability is expressed statistically, usually as a reliability coefficient, which is attained by establishing the correlation between variables e.g. a reliable test has a reliability coefficient of 1. Reliability is about consistency while validity is about appropriateness of an instrument. Gay, Mills & Airasian (2012: 165), note that “a valid test is always reliable, but a reliable test is not always valid.”

For the purposes of this study on KM, the validation of instruments was done before the instruments were tested for reliability. This is evident because institutions of higher learning have similar personnel with similar qualifications though they could have different work experiences. The same applies to the engineering firms identified in the preceding sections. Reliability is therefore the extent to which results are consistent over time (Hernon & Schwartz, 2009).

When the research process consistently gives the same results on recurring administration, it means that it is reliable (Hernon & Schwartz, 2009b). Repeatability of the measurement determines its reliability. Babbie (2010: 119) concurs that reliability means that if a particular technique is applied repeatedly to the same object it would yield the same results. Yin (2016) suggests that when the processes of a study such as the data collection techniques can be repeated, producing the same results, that shows that the method is reliable. As ways of estimating reliability, Hernon & Schwartz (2009b) suggests internal consistency, pre-testing, testing and re-testing of instruments.



### 3.9.1 Reliability of the questionnaire

The questions in the questionnaire were validated by the researcher in consultation with experts in this field, namely the supervisor and co-supervisor of this study. Responses from the questionnaire were checked for consistency of what they sought to elicit from the participants. Testing the reliability of a questionnaire as a measuring instrument was done using reliability analysis and the questionnaire items with missing answers were not considered. Moreover, the items on the questionnaire were further taken through a reliability analysis based on the Cronbach's Alpha coefficient. The reliability test was conducted on Likert-scale questions only and the figures are shown on **Table 3.1** below. Factual questions which required Yes/No responses were left out of the reliability tests because the proof was quite visible, for example the availability of Internet to support KM.

**Table 3.1 Reliability tests**

Research construct	Cronbach's Alpha	Sample (N)
1. Constructs of KM in organisations	0.95	112
2. Initiatives to enable knowledge sharing	0.52	112
3. Tools and technologies for supporting KM	0.92	112
4. The role of social media for KM	0.94	112
5. Effectiveness of knowledge transfer activities	0.90	112

Cronbach's alpha was used as the basis of the reliability test in this study. Cronbach's alpha has been found by Huck (2012) to be more flexible with the Likert scale. Huck further describes Cronbach's alpha as the underlying reliability coefficient used to provide a descriptive summary of the research data's consistency using a value between 0 and 1. Zero (0) represents total absence of consistency and one (1) represents total consistency of the data collection instrument.

In this case, all the alpha values were very close to 1, meaning that the measurement scale used in this study was quite reliable. The research hypotheses included in the questionnaire have been identified by the researcher from a thorough literature review, thus the researcher was quite confident that in line with their alpha values, these constructs convincingly measured the extent of KM effectiveness at the organisations studied.

### **3.9.2 Reliability of the interviews**

Interviews followed up the questionnaires distributed to the participants. Interview questions were drawn from the objectives of the research, thus guaranteeing their reliability in this regard. Cohen et al. (2011) advised that since in interviewing there “are as many interpretations as there are researchers”, one way of monitoring reliability is to have a structured interview with the same format, same sequence of words and same questions for each respondent. The structured interview guide (**Appendix 3**) used in this research ensured the qualitative findings were reliable. These interviews provided a wider coverage and deeper understanding of the research problem. The questioning style was consistent throughout all the institutions that participated in this study.

### **3.10 Ethical research considerations**

This research study was conducted with full reflection on the proper conduct of scientific enquiry. The researcher had the responsibility of protecting the anonymity of the research participants and to store the collected data in a strictly confidential manner. The data obtained from the respondents was kept confidentially and names of all research participants were not recorded either on paper or in electronic format. Anonymity and confidentiality were highly considered in this study, making sure that the ethical principles in research are followed as highlighted by Babbie et al (2010) on the codes of good research practice.

Secondly, the researcher did not coerce participants into participating in this study (**Appendix 1**). The participants were notified about the aims and objectives of the study and then they participated out of their own volition. Most importantly, the researcher applied for authorisation to conduct the research from the centre heads of the respective institutions studied. Permission was granted to carry out this research and the authorisation letters are provided in Appendix 5, 6, 7, 8 and 9 of this document. In this study, a number of ethical issues were observed, including avoiding plagiarism and sticking to the principle of informed consent (**Appendix 10**) by the research respondents.

Finally, the researcher had the research proposal cleared by the higher degrees committee in the College of Science, Engineering & Technology (CSET) of UNISA. The researcher filled in the ethical clearance forms that were considered by the committee and certified that the research conforms to the necessary ethical practices in research. An ethical clearance certificate (**Appendix 4**) signed by the department chairman, director of the School of Computing and the executive dean was granted by the ethics review committee. The reference number of the certificate is **009/AHM/2017/CSET\_SOC**, valid for three (3) years from 13 March 2017 to 13 March 2020.

### 3.11 Summary

This chapter presented the research design, research sites, participants and the sample size. The chapter further discussed the data collection instruments used as well as their properties of validity and reliability in this specific study. The chapter also explained the methodology that the study employed and concludes with a statement on ethics that the researcher abides by throughout the study. The data collection instruments (questionnaire and interview guide) discussed in this chapter are attached in **Appendix 2** and **Appendix 3** respectively. The chapter provided the basis for data collection, analysis and presentation. The next chapter captures, analyses and presents the research results derived from questionnaires and the interview processes.

## CHAPTER FOUR - DATA ANALYSIS AND PRESENTATION

### 4.1 Introduction

This chapter presents and analyses the data collected from the participants in an endeavour to address the study objectives. This part was the pivot of the study as it helped in drawing conclusions and making recommendations. It dealt with the classification and analysis of the data captured. In the realm of qualitative analysis, King & Horrocks (2010), note that qualitative analysis uses individual interviews, focus group discussions, observations and reports to obtain data. In contrast, quantitative data analysis involves the process of statistically analysing scores collected through calibrated instruments to answer the research questions. The data analysis followed the triangulation approach where the data collected through questionnaires was supported by data collected using interviews.

According to Leedy & Ormrod (2010), once the reader understands the problem and the manner in which it was investigated, the next question seeks to find the evidence. To facilitate data analysis, all open-ended questions were pre-coded to ensure uniformity of responses. The data was then coded, sorted and analysed using SPSS & Microsoft Office Excel 2013 package. A thematic approach was used during qualitative data interpretation where the research objectives acted as the themes according to which the data was classified, categorised and ultimately presented. The data was coded and presented in a consistent and logical sequence within this report.

In the data presentation section, the researcher stroke a balance between providing too much data and too little data. The researcher presented only the data and information relevant to the problem defined: **Knowledge Management and its effectiveness for organisational transformation through knowledge sharing and transfer**. The data analysis and presentation includes both descriptive and inferential statistics, but relied mostly on descriptive statistics. To lay a foundation for the presentation of descriptive statistics and other analyses, the following paragraph briefly restates the objectives of the study, and then the biographical information of the participants follows.

The objectives of the study were to explore the knowledge sharing initiatives. The study also sought to identify key challenges for ICTs in KM. More so, the study sought to identify and describe the barriers to effective KM and the subsequent solutions to overcome these barriers. Likewise the research sought to describe the tools deployed in organisations to support KM and most importantly the study analysed the importance of social media in KM. Measuring the effectiveness of knowledge transfer activities was also one of the prime objectives aimed at transforming the organisations investigated.

## 4.2 Demographical information of research participants

The first section of the questionnaire was concerned about the demographic details. Participants were drawn from the University of Namibia's Faculty of Education, Engineering and Information Technology. Other participants were from the International University of Management (IUM) and three consulting engineering firms namely: Consulting Services Africa, Conselect Consulting Engineers and the Ongwediva Consulting Engineers.

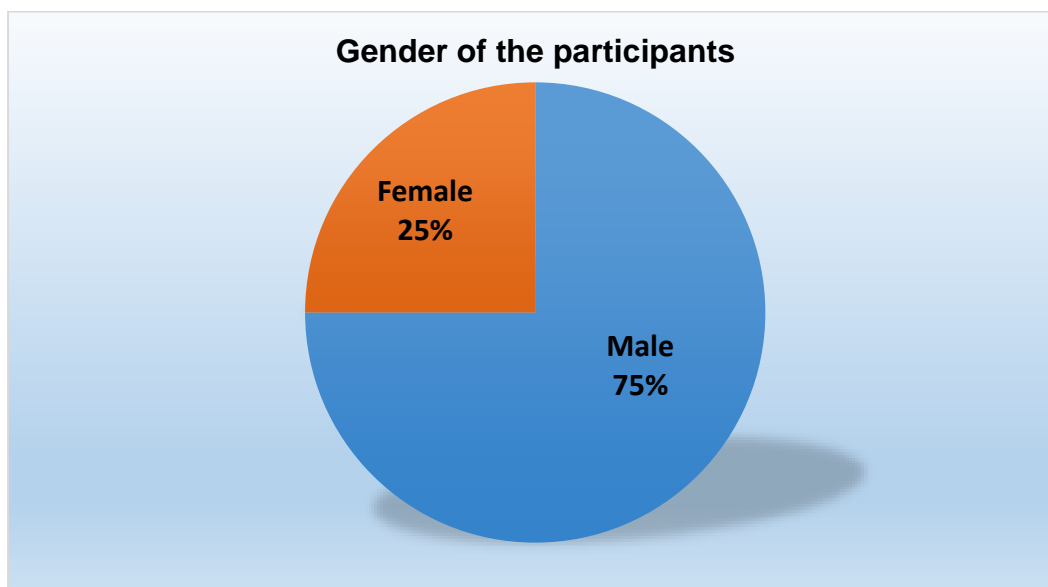
### 4.2.1 Gender of the participants

The following breakdown of participants was obtained and presented in **Table 4.1** and **Figure 4.1** below.

**Table 4.1 Gender of the participants**

Gender	Count	Percentage
Male	84	75
Female	28	25

The data about the participants is represented in a pie chart below. This type of chart is used to show proportions of a whole.



**Figure 4.1 Gender of the participants**

According to the empirical evidence gathered and presented in **Figure 4.1** above, it was found that there were more male lecturers and engineers than their female counterparts in the institutions investigated.

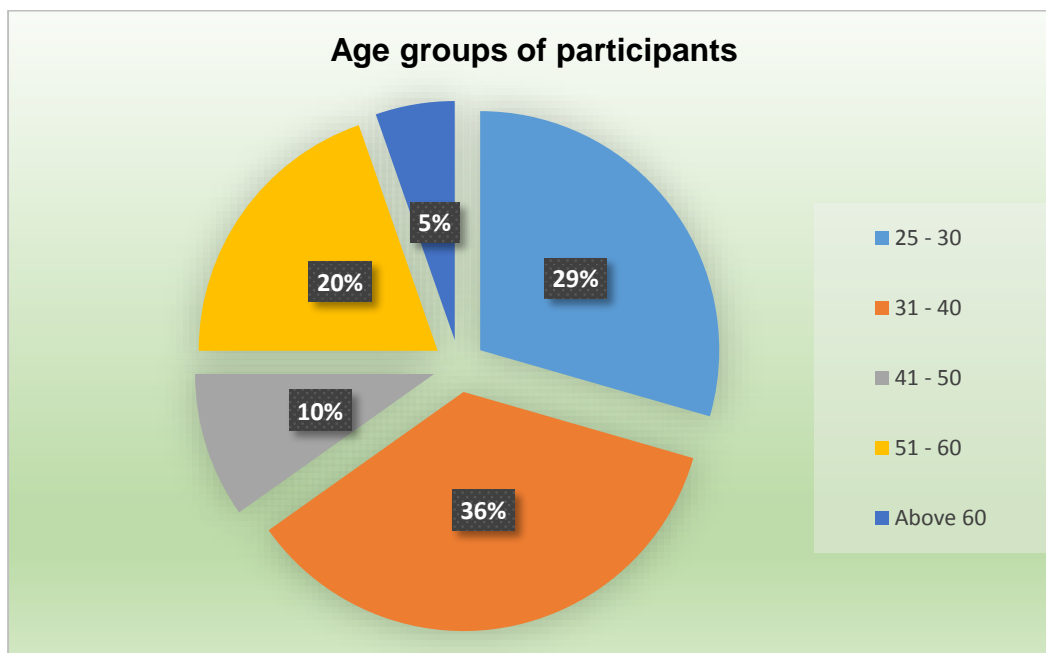
### 4.2.2 Ages of participants

There were no respondents aged less than 25. The majority of the participants were in the middle age group, 31 – 40, with a 36% representation. Out of the 112 participants who completed the questionnaire, 29% of them were in the age group, 25 - 30 years. This was followed by 20% of the participants who were in the 51 – 60 age group. Age group 41 – 50 had 10% representation. Participants above 60 years constituted only 5% of the entire respondents. The actual percentages of age groups are presented in **Table 4.2** below.

**Table 4.2 Ages of the participants**

Age (years)	Count	Percentage
Less than 25	0	0%
25 - 30	33	29%
31 - 40	40	36%
41 - 50	11	10%
51 - 60	22	20%
Above 60	6	5%

The pie chart, Figure 4.2 below shows the various age groups of participants in this study.



**Figure 4.2 Ages of participants**

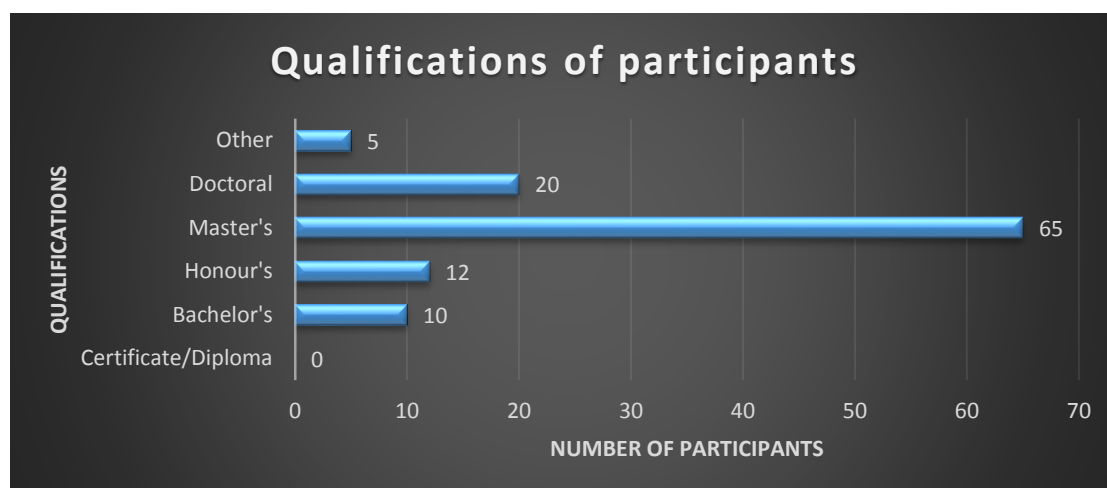
Inferences drawn here suggest that participants in the 31 - 40 age group who constitute the majority still have a lot to offer to the various portfolios and organisations where they are engaged.

### 4.2.3 Qualifications of the participants

Most of the participants in the academic sector had at least a Master's degree. This could be due to the fact that most universities have generic requirements for their teaching staff. One should be in possession of at least a Master's degree to teach undergraduates. All participants who were interviewed at universities were actively involved in teaching and learning. Participants in the consulting engineering firms had either a Bachelor's or an Honours degree and were actively involved in the design of systems and project management. The fact that all the participants were degree holders indicates their high intellectual attainments and competence in their respective niche areas. This purposive sampling ensured that the participants gave the correct information regarding the KM practices and processes. **Table 4.3** and **Figure 4.3** below shows the actual figures of the participants' qualifications.

**Table 4.3 Qualifications of the participants**

Highest Qualification	Count	Percentage
Certificate / Diploma	0	0%
Bachelor's degree	10	9%
Honour's degree	12	11%
Master's degree	65	58%
Doctoral degree	20	18%
Other	5	4%



**Figure 4.3 Qualifications of the participants**

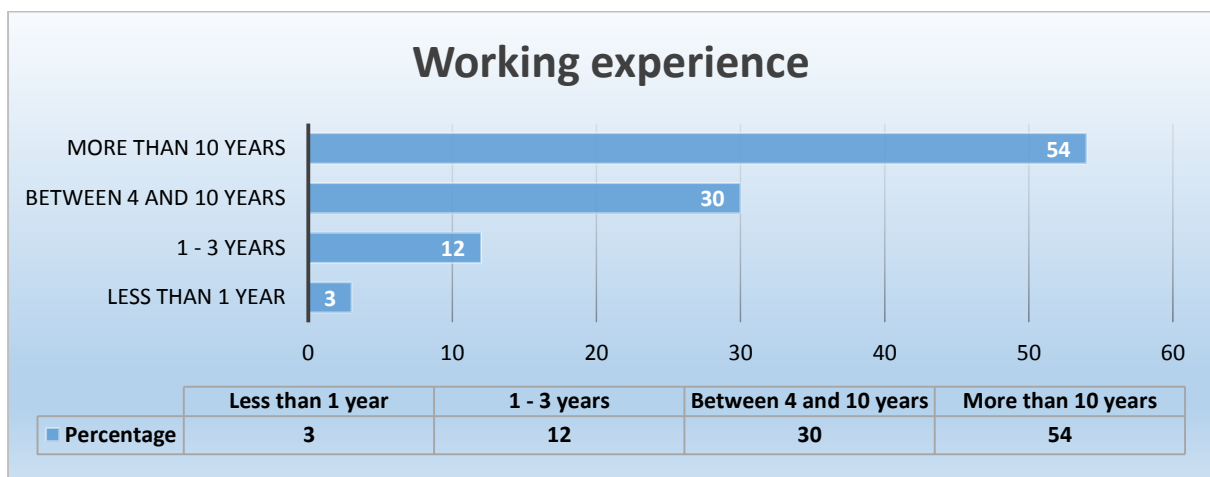
As can be observed from **Figure 4.3** above, over 50% of the participants had at least a Master's degree. This was followed by doctoral degree holders. 12 participants had Honour's degrees while 10 participants had general Bachelor's degrees in different disciplines. The other 5 participants indicated that they had other qualifications which did not require specification and did not fall into any of the pre-defined categories in this study.

#### 4.2.4 Working Experience

Working experience is very vital, especially at institutions of higher learning and consulting engineering firms where KM is practiced. All participants in the university teaching sector had more than 3 years of working experience. This clearly indicated that the lecturers are, on face validity, effective in raising student achievements. The working experience of engineers varied as some were well experienced whilst others were freshmen. Freshmen need coaching and mentorship, hence the engagement in KM so as to transfer skills from experts to non-experts. **Table 4.4** and **Figure 4.4** below shows the working experience of the research participants.

**Table 4.4 Working experience of the participants**

Working experience	Count	Percentage
Less than one year	4	3%
1 – 3 years	13	12%
Between 4 and 10 years	34	30%
More than 10 years	61	54%



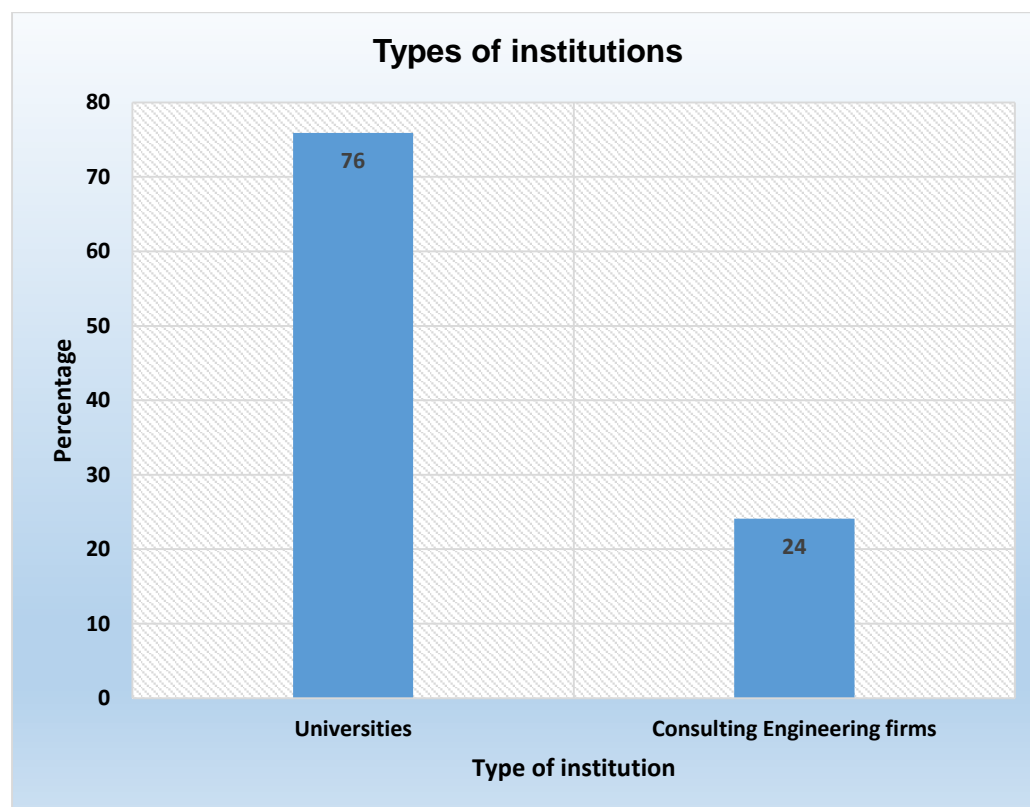
**Figure 4.4 Working experience of participants**

Working experience is very important to all organisations that aim to stay competitive in this global environment. Experienced workers boost organisational productivity as established in this case where 54% of the participants had more than 10 years of working experience. Jensen (2009) proved that experienced workers boost productivity by more than 20%. There is also an unstated element related to the experience of workers: their institutional memory is an important factor contributing to organisational functionality, competitiveness and reputation. The combination of these implies that KM could be enhanced through retention of experienced staff who are likely to share their knowledge and expertise with novices just entering the organisations and institutions.



#### 4.2.5 Types of institutions involved

As was described in the scope of the study, the participants were drawn from selected university faculties and consulting engineering firms. The number of participants per category are shown in the column graph below. 76% of the participants were from universities and the other 24% were from the engineering consulting firms. There were more participants from universities than from consulting engineering firms. All these participants (100%) and their respective institutions were based in the Oshana region of Namibia. These institutions were in close proximity to the researcher's duty station. **Figure 4.5** below shows the types of institutions which took part in this study.



**Figure 4.5: Types of institutions investigated**

Universities and consulting engineering firms cannot fully function without tapping into KM because knowledge has to be transferred from experts to non-experts through various knowledge transfer activities such as coaching and mentoring. As stated earlier on in the research design chapter, the participants were selected through purposive sampling which is a non-probability strategy that is effective especially for this study where the researcher studies a cultural domain with knowledgeable experts. Purposive sampling was integral and essential to the quality of the data gathered. All the demographic information of the purposefully selected participants is summarised in **Table 4.5** on the next page:

**Table 4.5: Description of the research participants**

Variable	Variable categories	Number of participants	Percentage
Gender	Male	84	75%
	Female	28	25%
Age	Less than 25 years	0	0%
	25 – 30 years	33	29%
	31 – 40 years	40	36%
	41 – 50 years	11	10%
	51 – 60 years	22	20%
	Above 60 years	6	5%
Education	Certificate/Diploma	0	0%
	Bachelor's	10	9%
	Honour's	12	11%
	Master's	65	58%
	Doctorate	20	18%
	Other	5	4%
Experience	Less than 1 year	4	3%
	1 – 3 years	13	12%
	4 – 10 years	34	30%
	More than 10 years	61	54%

Having identified and analysed the demographic information of the participants, it is important at this point that we analyse the participants' awareness of the KM concepts and principles in their work environment. KM aware professionals might move other organisational staff from the "need to know" to the "need to share" paradigm in a globally competitive environment. The following sections analysed the participants' awareness in detail.

### 4.3 Analysis of the KM fundamentals

KM is a discipline which emerged in the 1990s and several theorists have been researching in this field since then. This study adopted the definition of KM by Stuhlmann (2012) which states that:

*KM is a conscious and consistent strategy implemented to gather, store and retrieve knowledge and then help distribute the knowledge to those who need it in a timely manner.*

Research has revealed that most organisations engage in KM activities without a full understanding of KM practices and processes (Omotayo, 2015). According to the quantitative data collected using a questionnaire, 70% of the participants in this survey indicated that they were aware of what KM entails. The other 30% indicated that they were not aware of the KM construct and how it functions and gets deployed in their very institutions. This was a Yes (I am aware of KM) or No (I am not aware of KM) question. The analysis followed the triangulation approach where data collected through questionnaires was supported by data collected using the interviews.

The researcher also used the interview process (**Appendix 3**) to determine the level of awareness about KM in organisations. The questions asked during the interviews were:

Have you ever heard of KM?

In brief, what does it involve?

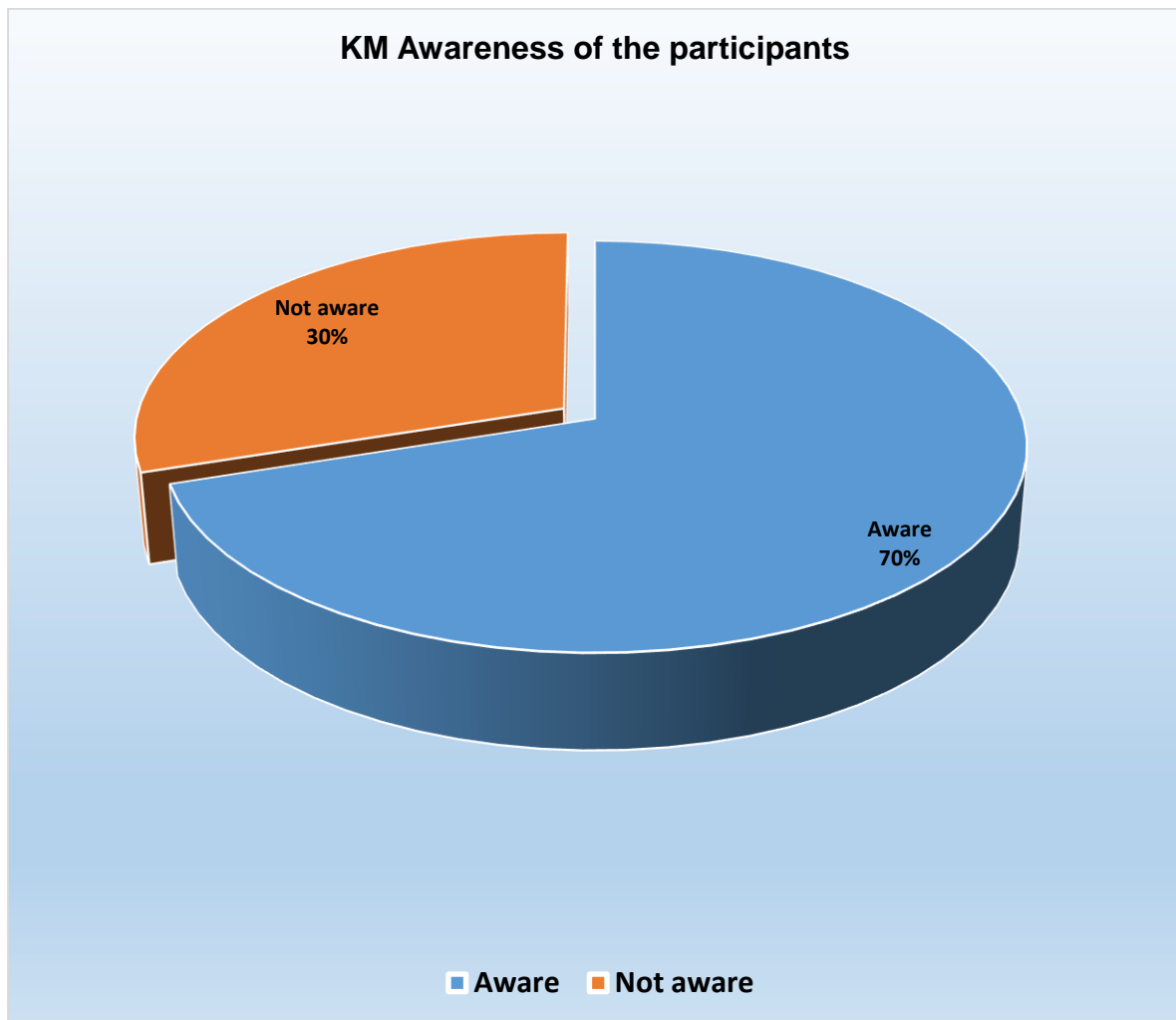
From your understanding, do you think KM is important in this organisation?

If so, why?

Personally, do you like sharing information and knowledge with your colleagues?

One of the interviewees responded as follows and I quote verbatim "Yes I have heard of KM", "KM involves skills transfer", "KM is important as it allows sharing of knowledge with colleagues", "Yes I like sharing knowledge with my peers and I enjoy sharing." These interviews were held with HODs and managers only as it was not possible to interview all the participants because of limited time and financial resources. The researcher used ratios where an HOD represented his department, for example one head of electrical engineering department represented all the other electrical engineers in that department.

**Figure 4.6** below shows the level of KM awareness of the research participants.



**Figure 4.6 KM awareness**

If an organisation wishes to harness the power of knowledge and the information it generates, its members must be dedicated to adopt and use the tools and processes created to enable the effective knowledge re-use (Naseej, 2016). Organisational members who are aware of KM will certainly promote and re-use knowledge and those who are not aware of KM should be encouraged to participate in KM practices and processes so as to boost organisational productivity. We can therefore deduce that the majority of the research participants were KM aware.

### **4.3.1 KM activities**

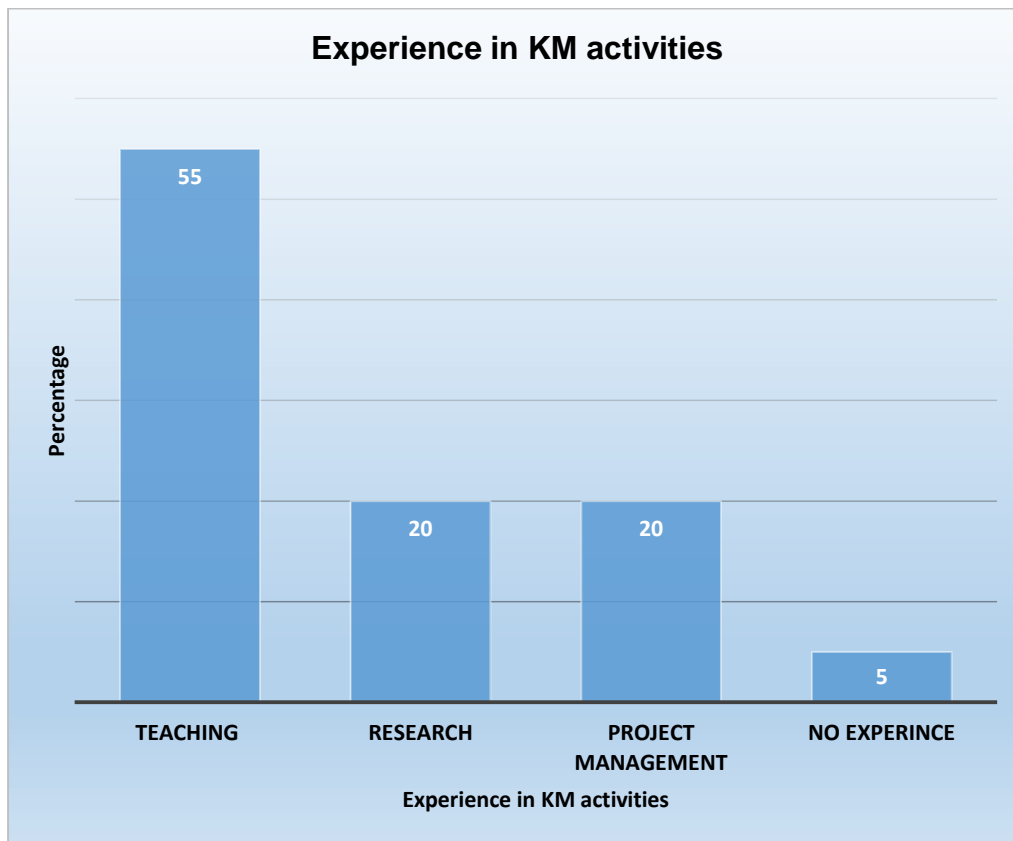
Knowledge acquisition entails the mechanisms that assist an organisation to possess knowledge relevant for executing their operations (Pentland et al, 2014). These activities involve teaching, research, curriculum development, consultancy and project management among others. The research participants in this study indicated that they were involved in different activities. Some were even involved in more than one activity. For example, university lecturers were involved in teaching, research and curriculum development. Engineers were also tasked with consultancy services, project design, project management and supervision.

Out of the 112 participants who returned fully-completed questionnaires, 68% were involved in teaching, research and curriculum development. The other 22% were actively involved in consultancy and project management. For this research question the participants were allowed to choose more than one activity in which they were actively involved in. The other 10% of the participants indicated that they were involved in other activities outside those that were outlined in the questionnaire. The KM activities of these participants contribute to organisational effectiveness and it is worth noting that engaging in KM activities will definitely boost organisational productivity and change organisations as observed by Rasula et al (2012).

Awareness has been identified by many researchers in KM and other disciplines as a key indicator of success in a range of performance environments (Potgieter et al, 2013). KM awareness programmes are aimed at creating KM initiatives that ensure success of the organisations (Uden et al, 2014). These programmes according to Uden et al (2014) include knowledge fairs and training. KM awareness needs to be enhanced through capacity building on various strategic levels.

### 4.3.2 Experience in KM activities

This study established that 55% of the participants had teaching experience before they joined their respective organisations. On the same question, 20% had experience in research activities whilst the other 20% had vast experience in project management. The other 5% of the participants had no experience when they joined their organisations. This information is shown in **Figure 4.7** below:



**Figure 4.7 Experience of participants in KM activities**

Experience is very important in Knowledge Management. Knowledge is gained from experience as stated by Schiuma (2012), Liebowitz (2012) and Girard & Girard (2015). It is not an exaggeration therefore to submit that experience plays a great part in the organisational transformation process. According to the results analysed in this study, well experienced workers who are motivated greatly contribute to organisational effectiveness and efficiency.

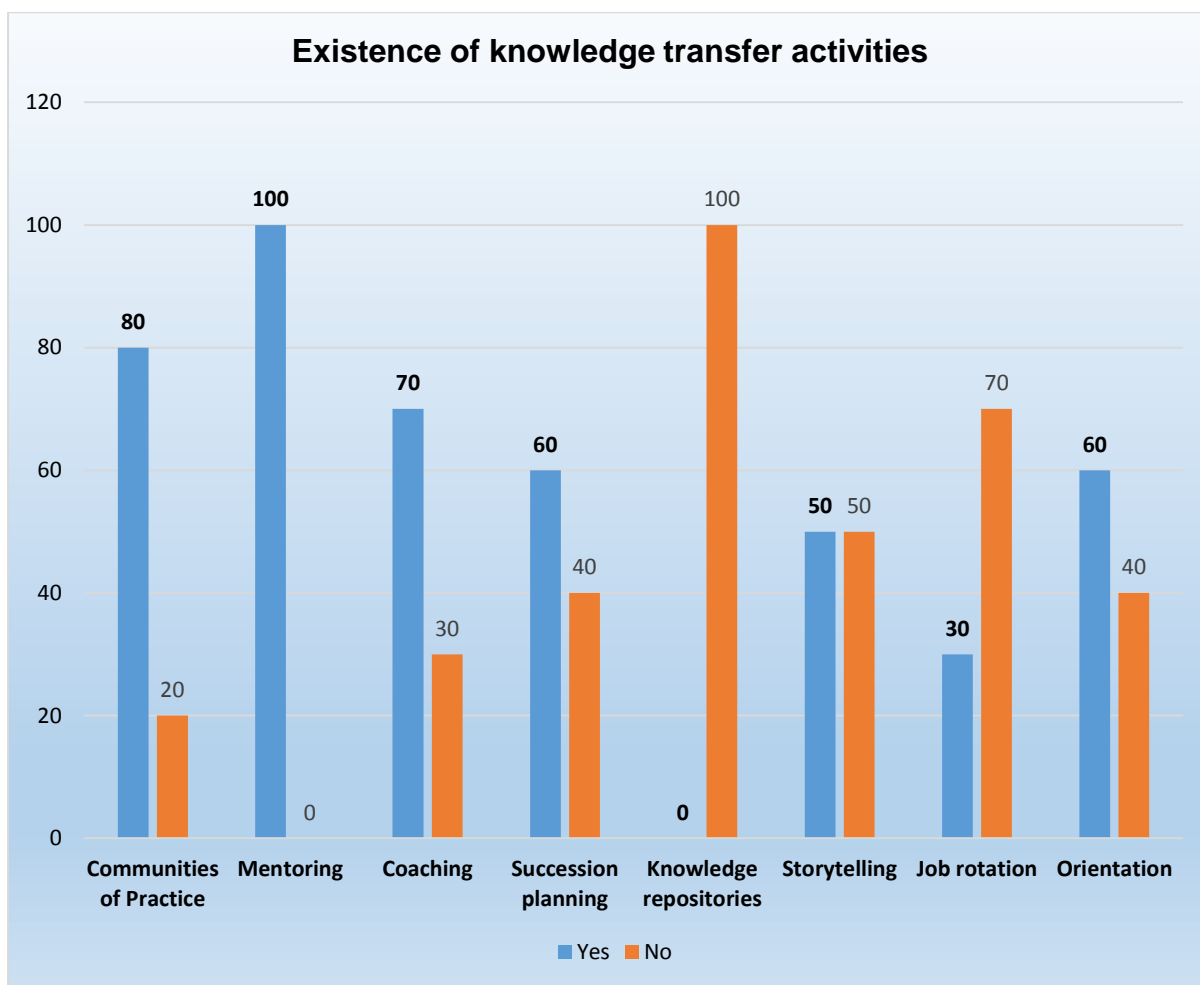
### 4.3.3 Knowledge transfer activities

Knowledge transfer refers to the flow of knowledge amongst individuals in organisations (Pentland et al, 2014). Such activities involve the specific interactions of individuals and making reference to codified, discipline-specific knowledge. The research participants indicated the existence and usage of the knowledge transfer activities as shown in **Table 4.6** below.

**Table 4.6 Existence and usage of knowledge transfer activities**

Knowledge transfer activity	Existence		Usage	
	Yes	No	Yes	No
Communities of Practice	90 (80.3%)	22 (19.7%)	84 (75.0%)	28 (25.0%)
Mentoring	112(100%)	0 (0.0%)	43 (38.3%)	69 (61.6%)
Coaching	78 (69.6%)	34 (30.3%)	45 (40.1%)	67 (59.8%)
Succession planning	67 (59.8%)	45 (40.1%)	73 (65.1%)	39 (34.8%)
Knowledge repositories	0 (0.0%)	112 (100%)	22 (19.6%)	90 (80.4%)
Storytelling	56 (50.0%)	56 (50.0%)	78 (69.7%)	34 (30.3%)
Job rotation	34 (30.3%)	78 (69.7%)	62 (55.4%)	50 (44.6%)
Orientation	67 (59.8%)	45 (40.1%)	62 (55.4%)	50 (44.6%)

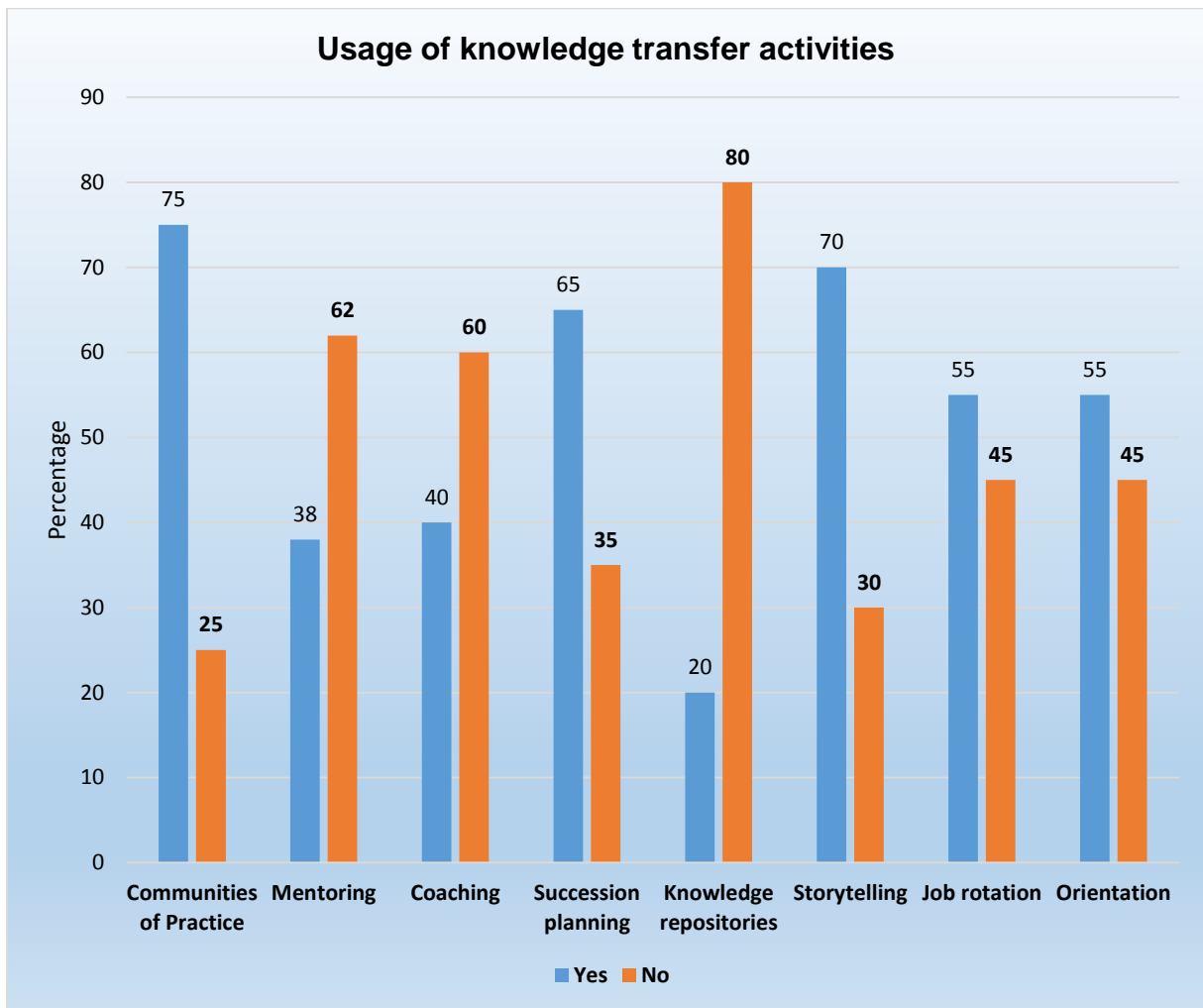
This table is supported by Figures 4.8 and 4.9 on page 95 and 96 which help us to visualise the research participants' responses with regard to their knowledge transfer activities. As a general mathematical rule, the percentages on the figures or charts have been rounded to the nearest 10.



**Figure 4.8: Existence of knowledge transfer activities**

All the knowledge transfer activities existed in some varying degree at all the institutions investigated, with the exception of knowledge repositories. 80% of the participants indicated existence of CoPs at their organisations. All the participants (100%) revealed that mentoring is a normative practice. Coaching and succession plans were recorded as existing within the organisations at 70% and 60% respectively. Participants further outlined that knowledge repositories do not exist at all at their respective organisations. Only 30% of the participants agreed that job rotation exists at their organisations. 60% of the participants confirmed that orientation exists at their organisations.



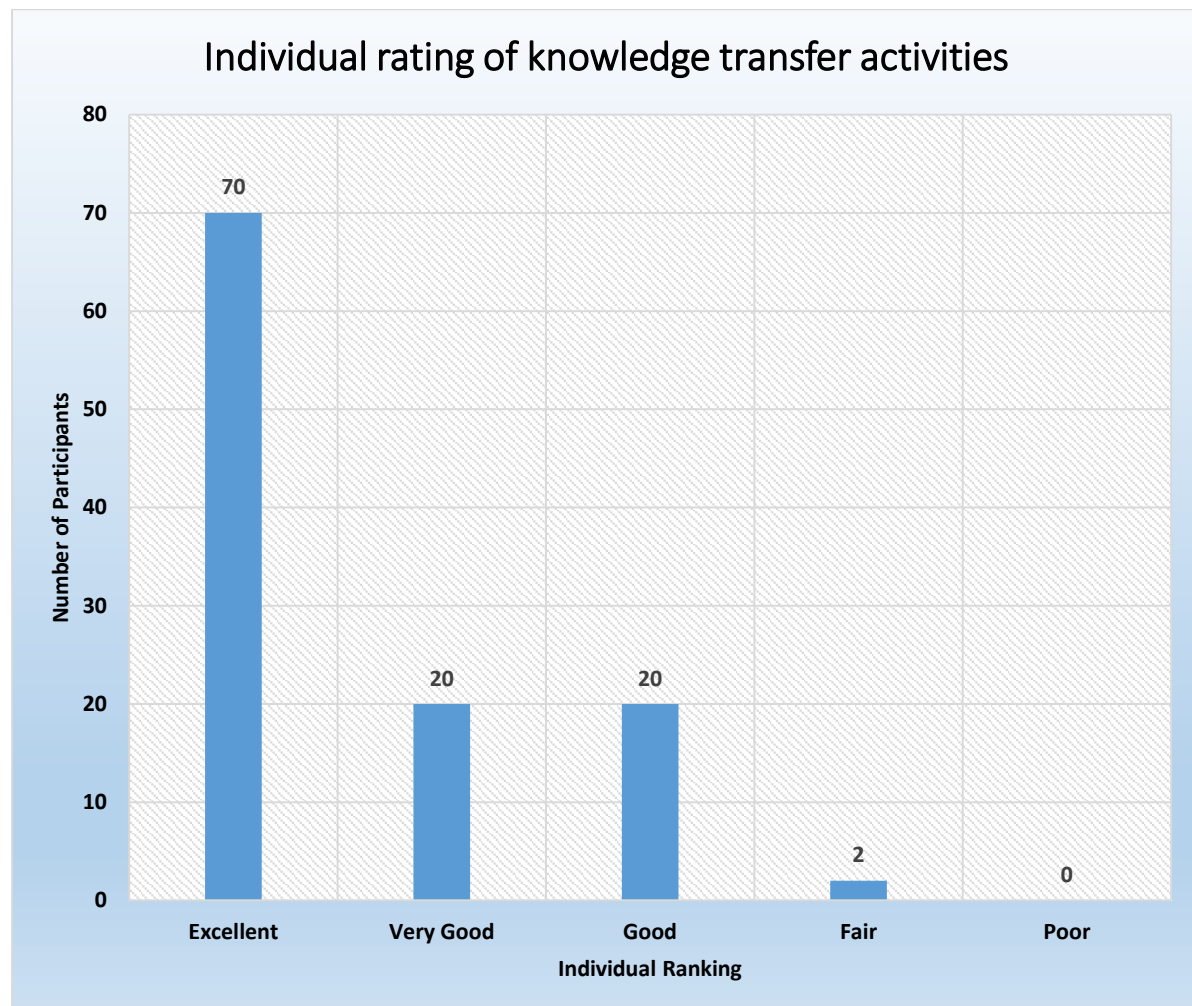


**Figure 4.9: Usage of knowledge transfer activities**

According to the data from the research participants, the most widely used knowledge transfer activity was a CoP with 75% representation. This was followed by storytelling with 70%. Succession plans have also been used by 65% of the participants. Orientation and job rotation were also found to be very helpful in transferring knowledge across the members of the organisations with 55% representation respectively. Transferring knowledge results in increased innovation and boosts productivity as revealed by Davenport & Harris (2007). The least used knowledge transfer activity is the knowledge repository because most of the participants have never used it and it is non-existent at their organisations as already shown in **Figure 4.8** on page 103.

#### 4.3.4 Individual rating of knowledge transfer activities

In rating their own knowledge transfer activities, participants indicated that they were “excellent”, “very good”, “good” and “fair”. These individual rating scores are shown in **Figure 4.10** below:



**Figure 4.10: Individual rating of knowledge transfer activities**

From the survey, 70 participants rated their knowledge transfer activities as excellent. In the same question, 40 participants rated their knowledge transfer activities as very good and good. Only 2 participants considered their knowledge transfer activities as fair. Having established that the majority of the participants are excellent in their knowledge transfer activities, it is essential to analyse the dimensions of KM in the various contexts. Several constructs were created in an endeavour to address the first objective which sought to describe the meaning of KM in an organisational context.

#### 4.4 Analysis of the KM constructs

A total of 18 statements were provided so as to come up with a suitable meaning of KM in the given organisational context. The statements sought the participant's opinion. These statements addressed the first objective of this study which sought to understand the meaning of KM. The literature reviewed has shown that KM facilitates fast and better decision-making in an organisation (Hoss & Schlusel, 2009), but the extent to which this is true in the organisations studied had to be established. Other hypotheses outline that KM enhances productivity and quality of service, thus creating competitive advantage.

More so, KM minimises loss of corporate memory as knowledge is represented and often archived in documents and databases. Also, KM creates an organisational culture devoted to continuous process improvement. Equally important, KM avoids repetition of tasks by promoting knowledge re-use. Creating competitive advantage for organisations is one of the prime objectives of KM. Therefore, KM improves team effectiveness and delivery of outcomes. Teamwork and collaboration are important for an organisation to achieve the KM goals.

KM facilitates a smooth transition from those retiring to their successors who are hired to fill in their positions (Durst & Wilhelm, 2012). Furthermore, KM avoids repetition of tasks by promoting knowledge re-use, specifically in minimising loss of corporate memory as knowledge is represented in documents and databases. Most importantly, it is worth mentioning that all KM efforts in an organisation require executive support that is needed to clarify strategic business objectives and make necessary decisions.

**Table 4.7** on the next page shows the responses from the participants with regard to the KM constructs in an organisational context. The number outside the brackets signifies the number of participants and the number inside the brackets signifies the respective percentage. Out of the 119 questionnaires returned by the participants, only 112 of them were used for the data analysis in this report (**Appendix 2**). The other 7 questionnaires were discarded by the researcher as they were not completed in full and it was deemed that their incompleteness was likely to affect the credibility of the results.

**Table 4.7 Constructs of KM in an organisational context**

<b>KM Construct</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Not Sure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
KM facilitates fast and better decision-making in an organisation	58 (52%)	21 (19%)	19 (17%)	9 (8%)	5 (5%)
KM enhances productivity and quality of service.	12 (11%)	37 (33%)	45 (40%)	11 (10%)	7 (6%)
Implementing KM results in sharing 'best practices.'	16 (14%)	41 (37%)	29 (26%)	17 (15%)	9 (8%)
KM increases innovation by the employees.	8 (7 %)	59 (53%)	26 (23%)	5 (5%)	14 (13%)
KM increases the learning capabilities of employees	23 (21%)	46 (41%)	21 (19%)	19 (17%)	3 (3%)
KM creates competitive advantage for institutions.	62 (55%)	36 (32%)	14 (13%)	0 (0%)	0 (0%)
KM assists in better staff attraction and also retention	10 (9%)	62 (55%)	27 (24%)	13 (12%)	0 (0%)
KM results in improved collaboration within the organisation.	13 (12%)	43 (38%)	47 (42%)	4 (4%)	5 (5%)
KM addresses the communication gap in the organisation.	6 (5%)	40 (36%)	35 (31%)	15 (13%)	16 (14%)
KM helps in continuous transformation of individual learning to organisational learning.	27 (24 %)	67 (60%)	15 (13%)	0 (0%)	3 (3%)
KM stimulates cultural change among employees.	8 (7%)	35 (31%)	51 (46%)	4 (4%)	8 (7%)
KM improves team effectiveness and delivery of outcomes.	30 (27%)	42 (38%)	31 (28%)	9 (8%)	0 (0%)
KM creates an organisational culture devoted to continuous process improvement.	20 (18%)	49 (44%)	6 (5%)	27 (24%)	10 (9%)
KM is supported by ICTs	51 (46%)	24 (21%)	20 (18%)	7 (6%)	10 (9%)
KM facilitates smooth transition from those retiring to their successors who are recruited to fill their position.	11 (9%)	58 (52%)	22 (20%)	13 (12%)	8 (7%)
KM minimizes loss of corporate memory as knowledge is represented in documents and databases.	23 (21 %)	56 (50%)	17 (15%)	16 (14%)	0 (0%)
KM avoids repetition of tasks by promoting knowledge re-use.	7 (6%)	25 (22%)	61 (54%)	14 (13%)	5 (5%)
All KM efforts require executive support.	70 (63%)	27 (24%)	10 (9%)	5 (5%)	0 (0%)

From the collated results displayed in **Table 4.7** on the previous page, 52% of the participants strongly agreed that KM facilitates fast and better decision-making in organisations. 19% also agreed to this premise and 17% were not sure if KM facilitates better decision making. Only 13% were of the opinion that KM does not facilitate decision-making with 8% disagreeing and 5% strongly disagreeing respectively. On productivity enhancement, 33% of the participants agreed that KM improves productivity and quality of services. 45% of the participants were not sure if KM enhances productivity. Best practices are important all KM undertakings and 14% of the participants strongly agreed that implementing KM results in sharing 'best practices.' 37% of the participants agreed that KM implementation results in sharing best practices.

More so, 53% of the participants agreed that KM increases innovation by the employees. On the same aspect, 23% were not sure if KM increases innovation. 5% and 13% disagreed and strongly disagreed respectively that KM increases innovation by employees. Only 21% of the participants strongly agreed that KM increases learning capabilities of employees. Learning is part of continuous process improvement which should result in fewer mistakes by employees. 19% of the participants were not sure if KM really increases learning capabilities. On the negative side, 19% disagreed with the increase in learning capabilities as a result of KM. On the dimension of KM creating competitive advantage for institutions, 55% strongly agreed, 32% agreed whilst 13% were not sure whether KM creates competitive advantage, which according to Magretta (2012) is a condition that puts an organisation in a favourable position.

Majority of the participants submitted that KM assists in better staff attraction. To be precise, 55% agreed that KM assists in staff attraction and retention. Collaboration in KM entails effective teamwork (Whyte & Classen, 2012). On the collaboration concept, 42% of the participants were not sure if KM improves collaboration. 5% and 36% of the participants strongly agreed and agreed respectively that KM addresses the communication gap within an organisation. 13% and 14% disagreed and strongly disagreed that KM addresses the communication gap though Muhat (2015) advises that KM closes the communication gaps in organisations.

Exactly 60% of the participants agreed that KM helps in continuous transformation of individual learning to organisational learning. 13% of the participants were not sure about the organisational learning whilst a small number of 3% strongly disagreed that KM helps transform individual to organisational learning. Organisational learning is one of the major goals of KM (Mosconi & Roy, 2013). It was recognised that 40% of the participants in this study were not sure if KM stimulates cultural change among employees.

It was established that 27% of the participants strongly agreed that KM improves team effectiveness and delivery of outcomes. Another 38% also agreed with the construct that KM improves team effectiveness. There was no participant who strongly disagreed that KM improves team effectiveness. This definitely meant that an effective team improves organisational performance. 18% and 44% of the participants strongly agreed and agreed that KM creates an organisational culture devoted to continuous process improvement and such culture devoted to continuous process is desired in all organisations as stated by Hassam & Al-Hakim (2012).

On the ICT construct, 46% of the participants strongly agreed that KM is supported by ICTs which provides platforms for knowledge sharing. This finding is consistent with Soto-Acosta & Cegarra-Navarro (2016) who states that ICTs have created new possibilities for KM. Over 50% of the participants agreed that KM facilitates smooth transition from those retiring to their successors who are hired to fill their positions. This finding means succession plans are a key component of KM as also observed by Durst & Wilhelm (2012). 50% of the participants agreed that KM minimises loss of corporate memory as knowledge is represented in documents and databases.

On the dimension of promoting knowledge re-use, only 22% of the participants agreed with the opinion and the majority (54%) were not sure if KM promotes knowledge re-use. Most importantly, 63% of the participants strongly agreed that all the KM efforts require executive support. Only 5% of the participants disagreed that KM efforts require executive support. There was no participant who strongly disagreed that KM requires executive support, thereby showing that every organisation defines KM in its own context (Siegel & Shim, 2010; Koenig, 2012; Frost, 2014; Girard & Girard, 2015; Liu, 2016).

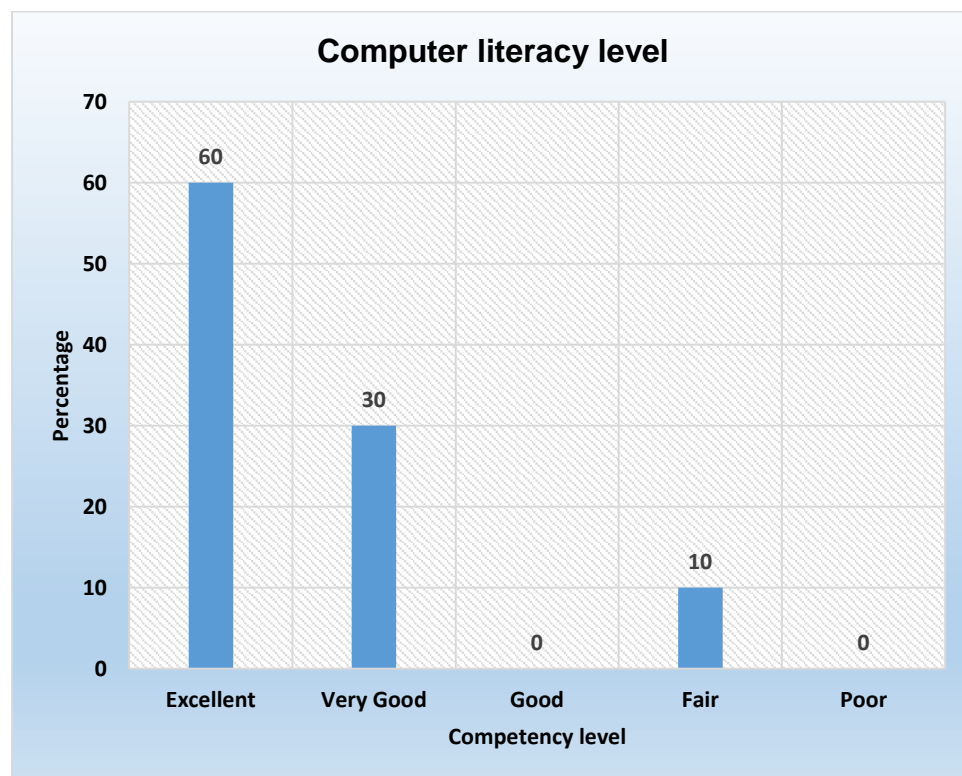
We can therefore extrapolate that, in the organisations studied, KM means facilitating fast and better decision-making as represented by 71% of the participants who strongly agreed and agreed with the construct. We can further generalise that KM creates competitive advantage for organisations where 87% of the participants strongly agreed and agreed with the dimension. In addition, we can deduce that KM helps in continuous transformation of individual learning to organisational learning as indicated by the participants with 84% representation on strongly agreeing and agreeing. Since 71% of the participants strongly agreed and agreed that KM minimises loss of corporate memory, we can further reason that minimising loss of corporate memory is a fundamental aspect of KM. We can finally conclude that KM is a practice which requires executive support as 87% of the participants strongly agreed and agreed that all KM efforts require management support.

## 4.5 Analysis of the challenges of ICTs for KM

ICTs play a vital role in KM activities such as knowledge capture, sharing, transfer and storage (Hansen et al, 2014). ICTs facilitate and support various KM activities by providing an enabling environment and they can also be used to share knowledge in most organisations. The participants in this study responded positively with regard to their computer literacy levels.

### 4.5.1 Levels of computer literacy

Out of the 112 participants who took part in this study, 60% of them rated their computer literacy skills as excellent. 30% rated themselves as very good while the other 10% considered themselves as fairly literate. We can therefore conclude that all participants were computer literate even though at varying levels of competence. The computer literacy levels of the participants are represented on **Figure 4.11** below. According to the information gathered and presented from the participants we can see that the problems that they face are non-technical as they are all computer literate.



**Figure 4.11 Computer literacy levels of the participants**

Various technologies are used to support KM in institutions and organisations. According to Badia (2014), digital competency is necessary for full participation in the knowledge society. The participants were asked to indicate their digital competency skills for various technologies as explained in the following paragraphs.

#### 4.5.2 Analysis of the competency levels on digital technologies

In rating their own digital technology competencies, the participants responded differently to the research question posed. **Table 4.8** below illustrates the percentages of the competency levels of participants with regard to the use of devices and technologies used in KM.

**Table 4.8 – Competency levels of the participants**

Digital technology	Never Used	Novice	Competent	Expert
Mobile (Cell) phone	0 (0%)	0 (0.00%)	95 (85%)	17(15%)
Tablet computer	0 (0%)	20 (18%)	70 (63%)	22 (19%)
Laptop	0 (0%)	0 (0%)	43 (38%)	69 (62%)
Electronic mail	0 (0.00%)	0 (0%)	99 (88%)	13 (12%)
Wiki's	25 (22%)	70 (63%)	17 (15%)	0 (0%)
Knowledge bases	90 (80%)	21 (19%)	1 (1%)	0 (0%)
Blogs	33 (29.5%)	74 (66%)	5 (4.4%)	0 (0%)
Discussion Forums	4 (3.5%)	27 (24%)	60 (53.5%)	21 (19%)

All participants indicated that they were either competent or experts in cell phone usage. From the data above it was found that 88% of participants were competent with e-mail usage and 12% were experts. This shows that e-mail technology was the most widely used technology for knowledge transfer by the participants at the institutions investigated. Majority of the participants indicated that they were able to use tablet computers and laptops to share knowledge. 80% indicated that they had never used knowledge bases. This could have been caused by resistance to change to adapt new forms of knowledge sharing or this anomaly could have been attributed to the fact that these technologies are not available at their organisations. Only 22% of the participants indicated that they have never used Wikis while 70% considered themselves novices. This suggests that though Wikis might be an integral component of ICTs, its popularity and the manner in which it is accessed and deployed in the organisations investigated remains problematic.

On average 43.5% of the participants were competent with all the digital technologies while 18% were experts in the use of all the digital technologies. 24% were novices; meaning that these participants needed training in digital technologies so as to bridge the KM digital skills gap. Wikis, Blogs and knowledge bases recorded 15%, 4.4% and 1% respectively on the competence level. These three (3) digital KM technologies had all 0% of expert level users amongst the research participants. This could be attributed to the user-friendliness of these technologies for KM. Blogging aids participants to reflect and think judgmentally, thus developing critical thinking skills. Using critical thinking benefits participants to assess their arguments and those of others and by so doing new knowledge is created.



### 4.5.3 Availability and accessibility of ICT Infrastructure to support KM

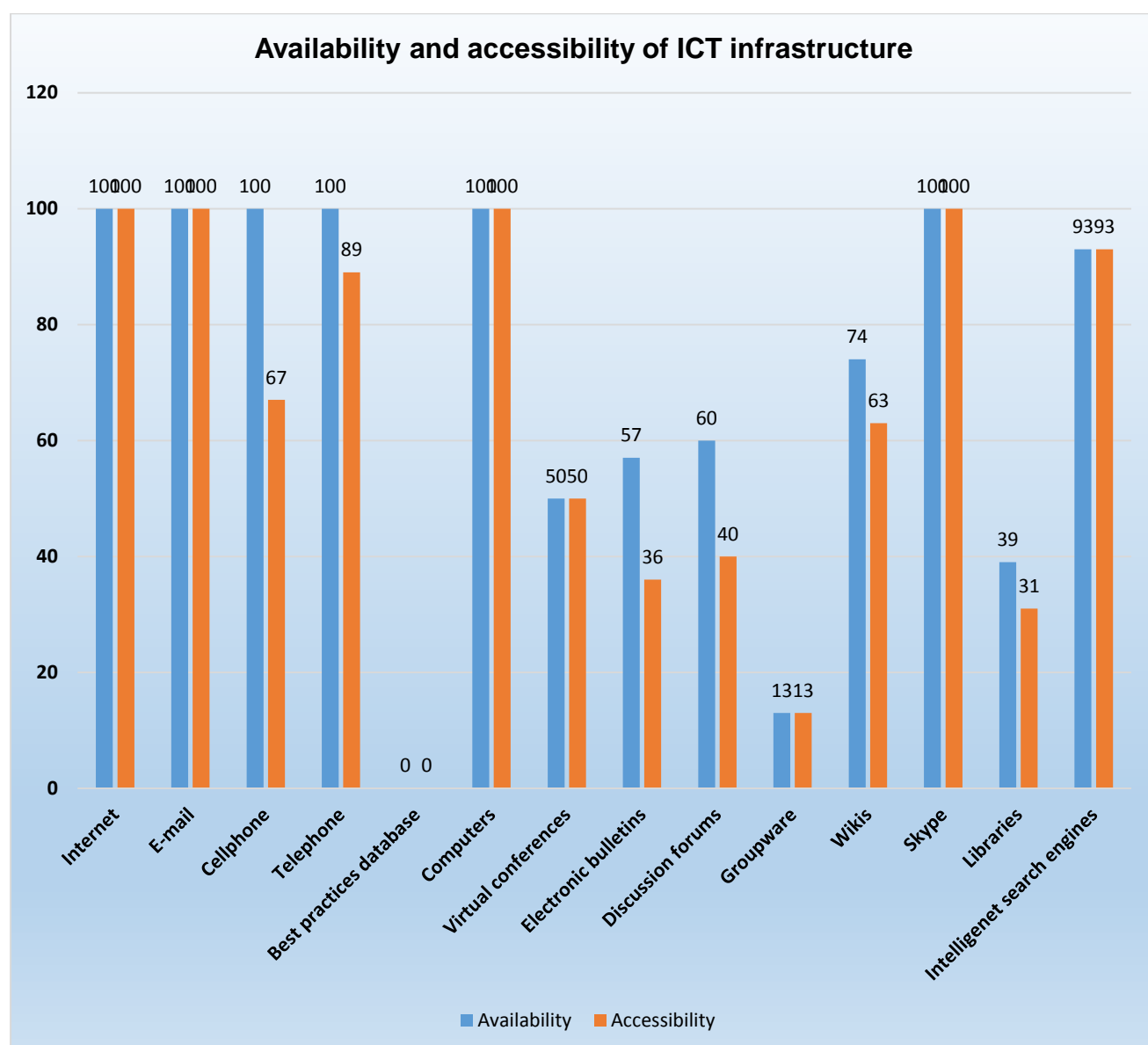
The institutions were equipped with various ICT equipment which could be used to capture and share knowledge. These technologies included but not limited to the following: Internet, e-mail, cell phone, telephone, best practices database, knowledge repositories, virtual conferences, electronic bulletins, discussion forums, groupware, Wikis, Skype, libraries and intelligent search engines. The participants responded as follows, with regard to the availability and accessibility of the ICT infrastructure at their organisations.

**Table 4.9: Availability and accessibility of ICT infrastructure**

ICT Infrastructure	Availability		Accessibility	
	Yes	No	Yes	No
Internet	112 (100%)	0 (0%)	112 (100%)	0 (0%)
E-mail	112 (100%)	0 (0%)	112 (100%)	0 (0%)
Cell phone	112 (100%)	0 (0%)	75 (67%)	37 (33%)
Telephone	112 (100%)	0 (0%)	100 (89%)	12 (11%)
Best practices database	0 (0%)	112 (100%)	0 (0%)	112 (100%)
Computers	112 (100%)	0 (0%)	112 (100%)	0 (0%)
Virtual conferences	56 (50%)	56 (50%)	56 (50%)	56 (50%)
Electronic bulletins	64 (57%)	48 (43%)	40 (36%)	72 (64%)
Discussion forums	67 (60%)	45 (40%)	57(51%)	55 (49%)
Groupware	15 (13%)	97 (87%)	15 (13%)	97(87%)
Wikis	83 (74%)	29 (26%)	70 (63%)	42 (37%)
Skype	112 (100%)	0 (0%)	112 (100%)	0 (0%)
Libraries	44 (39%)	68 (61%)	35 (31%)	77 (69%)
Intelligent search engines	104 (93%)	8 (7%)	104 (93%)	8 (7%)

100% of the participants agreed that there was free Internet and E-mail which was accessible to everyone within their respective organisations. According to this finding, there were no obstacles to obtaining knowledge because the institutions provided free Internet for participants which could be used to share knowledge with peers. Cell phones and telephones had different levels of accessibility depending on the organisational policies as the percentages above indicate. All the institutions studied indicated that they do not have best practices databases and 50% of the participants indicated the availability of virtual conferences which are accessible all the time. 60% indicated that discussion forums were available at their organisations. Other technologies like Wikis, Skype, libraries and intelligent search engines were available and accessible partially as indicated on **Table 4.9** above.

**Figure 4.12** below indicates the availability and accessibility of the ICT infrastructure to support KM at the organisations studied.



**Figure: 4.12: Availability & accessibility of ICT infrastructure**

Most of the technologies were available and were fully or partially accessible to almost everyone in the areas studied as **Figure 4.12** above reflects. Internet, E-mail, cell phone, telephone, computers and Skype were available to the research participants. Having discussed the availability and accessibility of ICT infrastructure, this report moves on to analyse the training needs of users.

#### 4.5.4 Analysis of the training needs on ICT tools for KM

The questionnaire was structured to determine whether or not the participants need training on the ICT tools for KM. The questions asked were also Boolean, either the participant needs training on a specific technology or not. Most of these tools according to literature review segment of this report are very important in supporting effective KM (APQC, 2010). The responses given were as follows:

**Table 4.10: Training needs of the participants**

ICT tool	Training need	
	Yes	No
Internet	0 (0.0%)	112 (100%)
E-mail	0 (0.0%)	112 (100%)
Cellphone	0 (0.0%)	112(100%)
Telephone	0 (0.0%)	112 (100%)
Best practices database	99 (88.4%)	13 (11.6%)
Virtual conferences	73 (65%)	39 (35%)
Electronic bulletins	7(6.25%)	105 (93.7%)
Discussion forums	23 (20.5%)	89 (59%)
Groupware	66 (41%)	46 (59%)
Wikis	57 (50.1%)	55 (49.1%)
Skype	11(10%)	101 (90%)
Libraries	13 (41%)	17 (59%)
Intelligent search engines	81 (72.3%)	31 (27.6%)

All the participants in this study indicated that they did not need training on Internet, e-mail, cell phone and telephones for knowledge sharing. This result indicated that the participants were conversant with the use of these technologies for sharing knowledge. As can be observed from the data in the **Table 4.10** above, 88.4% of the participants indicated that they need training in the use of best practices databases. 65% required training on how to use virtual conferences. The participants who needed training on discussion forums constituted 20.5%, while those who needed training in groupware constituted 41% and 50.1% for Wikis.

From the survey, 90% of the participants did not need training on how to use Skype. More so, 59% of the participants did not need training on how to use libraries. A significant 72.3% of the participants needed training on how to use intelligent search engines which, according to Google (2014), tracks the individual user's search behaviour and adapts its algorithm to their habits.

#### **4.5.5 Other challenges of ICTs for KM**

The participants highlighted that they greatly needed training in the use of best practices databases, virtual conferences and Wikis for KM. This was due to the fact that these technologies are emerging on a daily basis and participants have to be kept updated all the time. Other challenges indicated by participants included the use of intelligent search engines in specific fields.

Due to the rapid advances in technology and knowledge sharing tools, participants indicated that they cannot cope with all the available IT tools. In addition, the participants highlighted that some IT tools are not aligned with their organisational goals, hence the need for a strategic IT alignment. The prime challenge highlighted by the participants was the technological trauma as there are so many advances in the information technology sector. Many participants are resistant to change, hence the need for a well-designed change management strategy which incorporates these emerging technological aspects. Resistance to change is defined by McCalman et al (2016) as the actions taken by individuals when they see that the change that is occurring is a threat to them.

The interview question on challenges of ICTs for KM was:

What are the main challenges you face with regard to ICTs for KM?

The data was analysed using content analysis because it provides an insight into complex models of human thought. Responses from participants included factors like usability issues and user-friendliness of the information technologies, specifically for knowledge sharing. Other points highlighted involved the growth rate of ICTs, where it was established that the participants cannot easily cope with all the new technologies that are emerging in the market on a daily basis. This finding is quite consistent with literature where Soto-Acosta & Cegarra-Navarro (2016) point out that the nature of new ICTs for KM is on the rise.

## 4.6 Analysis of the initiatives to enable knowledge sharing

Creating a 'knowledge sharing culture' is considered as one of the most important knowledge sharing initiatives in any organisation. This section identified and categorised the participants' views on knowledge sharing initiatives. The responses were spread on a Likert type scale. In **Table 4.11** below, the number outside the brackets signifies the actual number of participants and the number inside the brackets represents the corresponding percentage of the participants.

**Table 4.11: Initiatives to enable knowledge sharing**

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
My institution's management supports KM activities.	4 (3.6%)	30 (26.7%)	47(41.9%)	23(20.5%)	8 (7.1%)
My institution supports and promotes a knowledge sharing culture.	15 (13.3%)	73 (65.1%)	11 (9.8%)	9 (8.0%)	4 (3.6%)
My institution has the necessary technology to support KM	60 (53.5%)	26 (23.2%)	18 (16.0%)	8 (7.1%)	0 (0.0%)
My institution currently offers KM courses and workshops.	0 (0.0%)	9 (8.0%)	22 (19.6%)	51 (45.5%)	30 (26.7%)
My institution allows time to attend KM courses and workshops.	0 (0.0%)	11 (9.8%)	17 (15.1%)	48 (42.8%)	36 (32.1%)
My institution provides funding to attend KM courses.	6 (5.3%)	8 (7.1%)	23 (20.5%)	41 (36.6%)	34 (30.3%)
I have attended a session of KM activities such as coaching and mentoring.	11 (9.8%)	39 (34.8%)	20 (17.8%)	27 (24.1%)	15 (13.3%)
KM experience is a pre-requisite when recruiting staff at my institution.	0 (0.0%)	15 (13.3%)	28 (25.0%)	61 (54.4%)	8 (7.1 %)
My institution has a succession plan.	5 (4.5%)	3 (2.7%)	59 (52.7%)	31 (27.7%)	14 (12.5%)

Management support is very important for all KM initiatives to succeed (Islam et al, 2011). 26.7% of the participants agreed that their organisations' management supports KM initiatives. 41.9% were not sure whether their management supports KM activities or not. 13.3% and 65.1% strongly agreed and agreed that their institutions support and promote a knowledge sharing culture. Since KM is supported by appropriate tools and technologies, 53.5% of the participants indicated that their organisations have the necessary technology to support KM. 23.2% also agreed that their institutions have the technology necessary to support KM.

Apart from that fact that the participants had all the technology to support KM, 45.5% disagreed that their institutions offer KM courses and workshops. 42.8% also disagreed that their institutions allow time to attend KM courses and workshops. On the same platform, 15.1% were not sure whether their institutions allow them time to attend KM workshops. There were no participants who strongly agreed with the institutions allowing time to attend KM workshops and courses. Only 9.8% agreed that their organisations allow time to attend KM courses. This representation could be attributed to the responses from the management team of the institutions.

Organisations require a budget for KM efforts to be fruitful, but at the organisations studied, 36.6% of the participants indicated that their institutions do not fund KM courses. KM courses are very important, especially in this era which is highly dependent on technology. On the participants' responses, 34.8% of them have attended KM activities such as coaching and mentoring. 17.8% of the participants were not quite sure whether they have attended a KM session. This could be due to the fact that these participants were not aware of what KM entails. KM experience was not considered as a prerequisite when recruiting staff at the organisations studied and 54.4% of the participants clearly indicated that KM experience was not a pre-requisite when recruiting staff at their institutions. Exactly 25% of the participants were not sure if KM experience was a pre-requisite when recruiting new staff. Also, 52.7% of the participants were not sure if their organisations had succession plans.

Most of the responses to knowledge sharing initiatives were mediocre, meaning that the initiatives should be taken seriously so that the organisations boost productivity and accelerate innovation. On initiatives for knowledge sharing the interview question was: "What initiatives do you think should be put in place to allow knowledge sharing in your organisation?" Most of the responses received from the 11 interviewees included offering and funding of KM courses, workshops and conferences. This interview data was analysed using content analysis in Microsoft Word and revealed the need for more KM workshops and conferences.

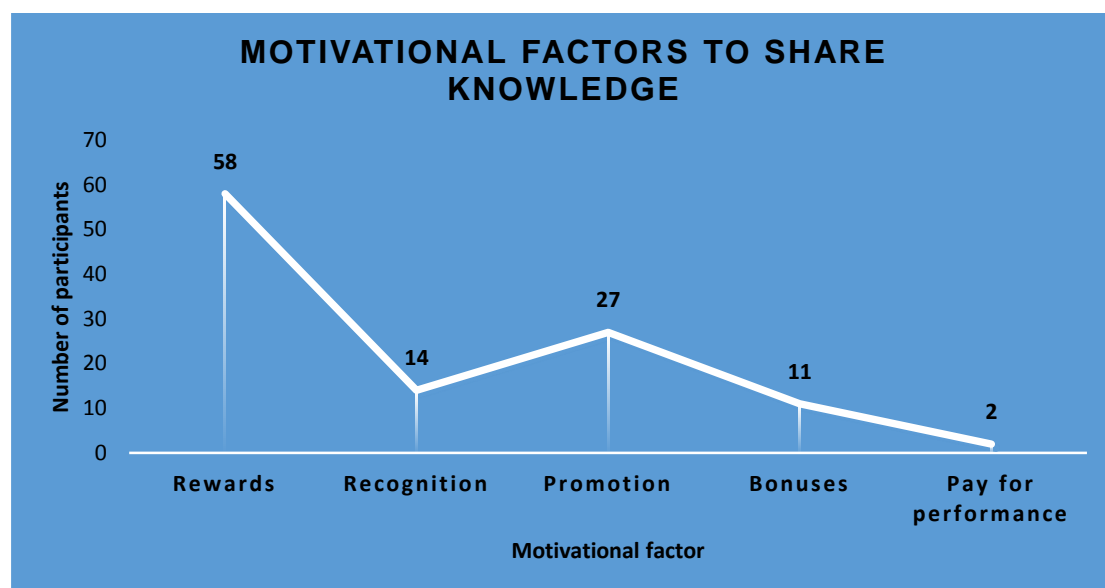
#### 4.7 Analysis of the motivational factors for experts to share knowledge

Motivation is very important for experts to share their valuable knowledge with others directly involved in their fields of expertise. This idea is supported by Stenius et al (2016) who state that motivation is important for all knowledge based work. Experts in different fields should be motivated in some way to share what they know with their juniors and other employees. The research question sought to find the most important motivational factor for experts to share what they know. **Table 4.12** below shows the responses from the participants.

**Table 4.12 Motivational factors**

Motivational factor	Frequency	Percentage
Rewards	58	51.8%
Recognition	14	12.5%
Promotion	27	24.1%
Bonuses	11	9.8%
Pay for performance plan	2	1.8%
Other	0	0.0%

Rewards recorded the highest proportion of 58 participants. This meant that every worker needs to be motivated if an organisation wishes to reach the KM goals. Recognition had 14 participants and promotion had 27 participants. 11 of the participants were convinced that a bonus is the best motivational factor for them to share what they know. Only 2 participants selected the pay for performance plans. There were no other forms of motivation, hence the frequency for this construct was zero. The responses are shown in **Figure 4.13** below:



**Figure: 4.13 Motivational factors for knowledge sharing (n=112)**

#### **4.7.1 Rewards**

Rewards recorded the highest percentage at the organisations studied, because they are more tangible forms of motivation. Exactly 51.8%% of the participants considered rewards as the best motivational factor for sharing knowledge. Deci (2012) emphasised that motivation is a key element to trigger behaviour and may vary in quality. Experts share because they want to and they appreciate seeing their knowledge being used. Therefore, they deserve to be respected by their colleagues and as such rewards need to be encouraged and promoted as the participants indicated. KM requires a unique view of rewards and recognition as observed by the APQC (2010).

#### **4.7.2 Recognition**

Recognition or appreciation recorded 12.5% of the research participants. The participants indicated that recognition should start from the management itself to show that they are doing a good job in sharing their knowledge with like-minded professionals. According to the responses from the open-ended questions, these 12.5% of the participants outlined that all they need is recognition from their superiors. This recognition may be at the individual, group, department, business, or organisational level, implying therefore that recognition can be at any level within an organisation. Ventrice (2010) states that individual performance leads to recognition which also increases productivity and satisfaction and this ultimately adds value to the organisations.

#### **4.7.3 Promotion**

On the question of promotion, 24.1% of the participants were of idea that they should be elevated from their current positions to greater heights and create opportunities for those they share knowledge with. According to Sunil (2014), promotion is an old form of motivation which has been in existence for a long time and is still very useful even in modern organisations. In general, every member of an organisation would like to be promoted to the next higher grade which would ultimately see an individual as a supervisor over others.

#### **4.7.4 Bonuses**

Bonuses recorded only 9.8% of the participants. This perhaps was due to the fact that every employee is entitled to a bonus every year whether he or she has shared knowledge or not. Bonuses are also among the oldest forms of motivation which still exist in most organisations even today and many employees feel that their hard work is recognised when they are given bonuses (Hankonen et al, 2016). Bonuses are investments which encourage employees to work better in future.



#### **4.7.5 Pay for performance**

Only 1.8% of the participants supported the pay for performance form of motivation. This definitely meant one has to be rewarded for what he has worked for, thus pay for performance is based on what has been performed by the individual. There were no participants who indicated that other forms of motivation are necessary for them to share knowledge.

Data on motivational factors for knowledge sharing was also gathered using interviews **(Appendix 2)**. The interview question on motivational factors was:

How do you want to be rewarded if you are to share your expert knowledge with your juniors?

This question was asked so that the researcher would establish the expectations of the participants so that recommendations based on the findings could be made in an effort to improve organisational performance. Again, content analysis using Microsoft Word was used to analyse the results looking directly at communication via transcribed texts. Eleven (11) transcripts were coded by the researcher and they revealed that participants wanted to be rewarded in monetary terms for their information-sharing efforts. Financial rewards have both positive and negative effects on organisational performance as revealed by Waqas & Saleen (2015) in their study on the effect of monetary rewards on employee engagement and firm performance. The effect of monetary rewards, like salaries and bonuses, have importance in business organisations, especially profit making organisations. Other forms of rewards like recognition may be deemed equally important and could be supplemented with other opportunities.

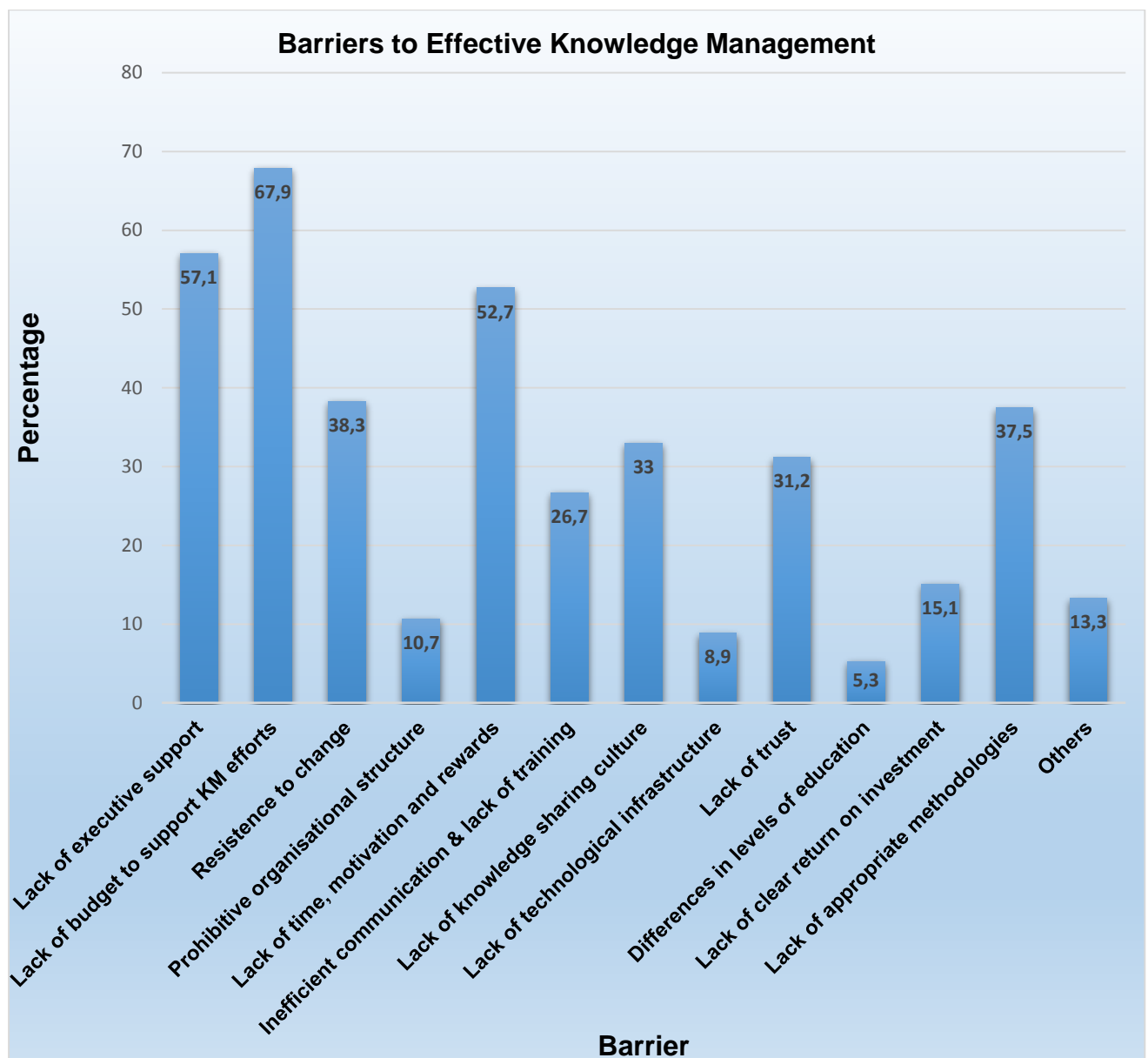
#### 4.8 Analysis of the barriers to effective KM

Barriers negatively affect the realisation of KM in most organisations. These barriers can be organisational, technological or individual as described by Riedge (2007). Contemporary studies, including this one, attempt to find ways to overcome these barriers and improve organisational performance. **Table 4.13** below indicates the barriers to effective KM and the responses elicited from the participants. The question was “Which of the following barriers affect the KM implementation at your institution?” For this question, the participants had an option to choose more than one barrier where it was necessary.

**Table 4.13: Analysis of the KM barriers**

Knowledge Management barrier	Number of participants	Percentage
Lack of executive support	64	57.1%
Lack of budget to support KM efforts	76	67.9%
Resistance to change	43	38.3%
Prohibitive organisational structure	12	10.7%
Lack of time, motivation and rewards	59	52.7%
Inefficient communication and lack of training	30	26.7%
Lack of knowledge sharing culture & cultural differences	37	33.0%
Lack of technological infrastructure	10	8.9%
Lack of trust	35	31.2%
Differences in levels of education	6	5.3%
Lack of clear return on investment	17	15.1%
Lack of appropriate methodologies	42	37.5%
Other (specify)	15	13.3%

It has been clearly revealed that lack of budget to support KM efforts is the greatest barrier to effective KM. Data collected shows that 67.9% of the respondents identified lack of budget support as a major barrier. Lack of executive support was second with 57.1% of the participants. Lack of time, motivation and rewards recorded 52.7%. All the other barriers recorded less than 50% of the participants. From this observation, we can conclude that lack of a specific budget targeted at sustained Knowledge Management was the biggest barrier to effective KM. Overcoming barriers could certainly improve organisational effectiveness, which was one of the aims of this research. **Figure 4.14** on the next page shows the barriers to effective KM and the bars are coded with each one showing the barrier and the percentage associated with it.



**Figure 4.14: Barriers to Effective Knowledge Management**

Many KM projects have failed in the past due to failure by organisations to address the KM hurdles, hence the need to assess these barriers at organisational level and find those which have a negative impact on KM success (Bloice & Burnett, 2016). These barriers to effective KM were further discussed and analysed in detail in the following sections which sought to identify which ones greatly affect KM implementation at the organisations studied. The barriers were analysed individually starting with the “lack of executive support” as it has been revealed in the literature review segment that KM efforts require management support (Singh & Kant, 2008; Ujwary-Gil, 2011; Oliva, 2014; Bloice & Burnett, 2016).

#### **4.8.1. Lack of executive support**

Lack of executive support recorded 57.1% of the participants. This meant that the management should support KM efforts in their organisations. Once this barrier is removed, all the other negative hurdles will be easy to remove because the support starts from the top on the organisational hierarchy. Executive support creates a conducive environment that inspires and stimulates knowledge sharing. Organisations engage KMOs specifically to formulate and implement knowledge policies. Management support is needed for leadership, responsibility and acceptance with a clear organisational vision (Singh & Kant, 2008).

#### **4.8.2. Lack of budget**

According to this study, the greatest barrier to effective KM was the “lack of budget” to support KM undertakings. It emerged that 67.9% of the participants indicated that a separate budget is necessary to realise the KM goals. Without a proper budget, no KM efforts would yield results that enhance the establishment, functionality and appropriation of KM practices in the organisations studied. Lack of budget is closely aligned to executive support because all the budgets are created and implemented by the organisation’s management. So these two barriers are closely connected. Taking into consideration that implementing any project requires some money, it is therefore essential to allocate funds for that project to be successful and 67.9% of the research participants agreed to this.

#### **4.8.3. Resistance to change**

On this specific construct, 38.3% of the participants were of the opinion that resistance to change is a barrier to effective KM. In this 21<sup>st</sup> century, organisations are changing the way they operate and the way they integrate new technologies into their operations, but people still resist change even if it brings greater efficiency and productivity. This percentage shows that most of the participants cannot easily change to new ways of doing things at their respective organisations. We can therefore conclude that change itself is not a problem but resistance to change is the problem which needs to be addressed, a point which was also raised by Beitler (2013) in his studies on strategic organisational change.

#### **4.8.4 Prohibitive organisational structure**

A small percentage of 10.7% of the participants indicated that the organisational structures at their institutions prohibit them from reaching the desired KM goals of knowledge sharing. Because the organisations studied were formal and delineated by organisational charts and job descriptions, employees report to their bosses who sometimes turn down their gestures and efforts to share knowledge. All organisations studied had a line organisational structure which tends to simplify and clarify authority, accountability and responsibility.

#### **4.8.5 Lack of time, motivation and rewards**

Time and time management are essential factors in almost all organisations. It emerged that 52.7% of the research participants considered lack of time, motivation and rewards as a great barrier to effective KM. Most managers do not have enough time to implement and manage KM projects. Employees can only have time for KM if they are motivated to do so and are rewarded accordingly for such efforts. This record of 52.7% shows that this barrier should be addressed and time should be created for KM efforts at the organisations studied.

#### **4.8.6 Inefficient communication and lack of training**

Communication is a vital tool in organisations. All forms of communication are essential be it verbal, face-to-face meetings or electronic platforms. 26.7% of the participants outlined that inefficient communication at their organisations was a barrier to effective KM. Lack of training in this case starts from understanding the meaning of KM in an organisation and the benefits it might bring. Effective communication is a very important characteristic of all knowledge workers (Muhat, 2015). An organisation is likely to be less effective if there is no proper communication, thus the communication gap needs to be closed.

#### **4.8.7 Lack of knowledge sharing culture**

Exactly 33% of the participants considered lack of a knowledge sharing culture as a barrier to effective KM. Knowledge sharing is at the heart of KM because knowledge must be shared and transmitted to the right person at the right time to make appropriate decisions which might improve organisational performance (Saenz et al, 2012). An appropriate organisational culture is a key aspect of successful KM implementation. Values and beliefs of the organisation's staff make up an organisational culture which should be committed to knowledge sharing. People should be willing to share their knowledge with others and by so doing learning takes place. This learning process will benefit individuals, groups and eventually the organisations.

#### **4.8.8 Lack of technological infrastructure**

Results indicated that 8.9% of the respondents considered lack of technological infrastructure as a barrier to KM effectiveness. This could be due to the fact that all the organisations studied have got all the tools and technologies to support KM. So this barrier does not really affect the implementation of KM efforts at these institutions and in addition to that, technology partially supports KM efforts by providing an enabling environment in which to share knowledge, a point raised by Song (2007).

#### **4.8.9. Lack of trust**

Trust is always linked to knowledge sharing. It is very important for any individual in an organisation to know whom to share their intellectual capital. As a consequence of this trust construct, 31.2% considered lack of trust as a barrier to effective KM. A low level of trust reduces the effectiveness of an organisation. This proposition is seconded by Rutten, Blaas-Franken & Martin (2016: 208) who noted that a lower level of trust within CoP results in less knowledge sharing. Knowledge has been perceived as the most critical resource an organisation should generate and protect, and it is a valuable organisational survival tool which must be effectively managed.

#### **4.8.10. Differences in levels of education**

Differences in the level of education recorded the least percentage of all the barriers with only 5.3%. This could be the case because all the participants in this study had almost the same levels of education and were working at similar institutions as reflected in the biographical section of this report on **Table 4.5**, page 97. The selection of the participants was done using purposive sampling which was based on the researcher's judgment as to who could provide the best solutions to the research questions asked. Therefore, differences in levels of education was not really seen as a barrier which could negatively affect KM endeavours at the organisations studied.

#### **4.8.11. Lack of clear return on investment**

Every investment should at some point yield quantifiable results. KM on its own is an organisational investment but 15.1% of the participants considered lack of clear return on investment as a barrier to effective KM at their organisations. It is difficult to quantify the returns of what has been invested in knowledge. There should be a significant business impact on productivity after a KM investment.

#### **4.8.12. Lack of appropriate methodologies**

The responses to this question showed that 37.5% of the participants considered lack of appropriate methodologies as a main barrier to effective KM. This has also been evident in the literature where it was found that there is no universal methodology for implementing KM at organisations (Schroeder et al, 2012). Different methodologies are used for different organisations depending on the organisational long term goals and objectives. Other barriers constituted 13.3% of the participants as shown in **Figure 4.14** on page 122. Overcoming these barriers and using correct tools improves organisational performance.

Since the study used partially mixed methods, data on the KM barriers was also collected using interviews. On barriers affecting KM implementation the section of the interview **(Appendix 3)** had three (3) questions which were asked the 11 interviewees:

Can you explain the barriers which affect the implementation of KM in this organisation?

How can the barriers you have just explained be overcome?

Do you have a budget for KM?

According to the themes coded in Microsoft Word using content analysis, different responses were found. Most of the interviewees mentioned the "lack of budget" barrier which may be removed by introducing a reasonable budget for KM efforts. In the same view, interviewees further stated that they do not have KM budgets at their organisations. These codes were relevant because they were repeated in several articles on the barriers to effective KM.

Organisational barriers like "lack of time" to pass knowledge on to others was a point raised by a significant number of interviewees. This could be the case because of time constraints as the interviewees had a lot of work. The lack of time barrier has been in existence since the inception of KM as a discipline in the 1990s and other researchers like Lastres (2011), Frost (2014), and Chong (2015) have been battling to overcome this hurdle. The other barrier stated by the interviewees was the lack of training to better share knowledge on IT systems. The barriers mentioned during the interviews could be classified into financial, technical and organisational barriers.

The financial barriers could be overcome by the introduction of a sufficient budget and availing the funds for KM. Technical barriers could be removed by tailor-made training courses in areas identified as deficient in specific skills specifically relevant for KM. Finally the organisational barriers could be overcome by engaging effective and efficient management in all the KM undertakings.

## 4.9 Analysis of tools and technologies to support KM

Several tools and technologies can be used for knowledge transfer and sharing. The tools are either IT-based or non-IT based. The question sought to determine whether the tools used meet the expectations of the expert to share knowledge or not. This data addressed the sixth objective which tried to match KM tools and technologies with organisational culture and structures in place. **Table 4.14** below shows the responses from the participants.

**Table 4.14 – Tools and technologies to support KM**

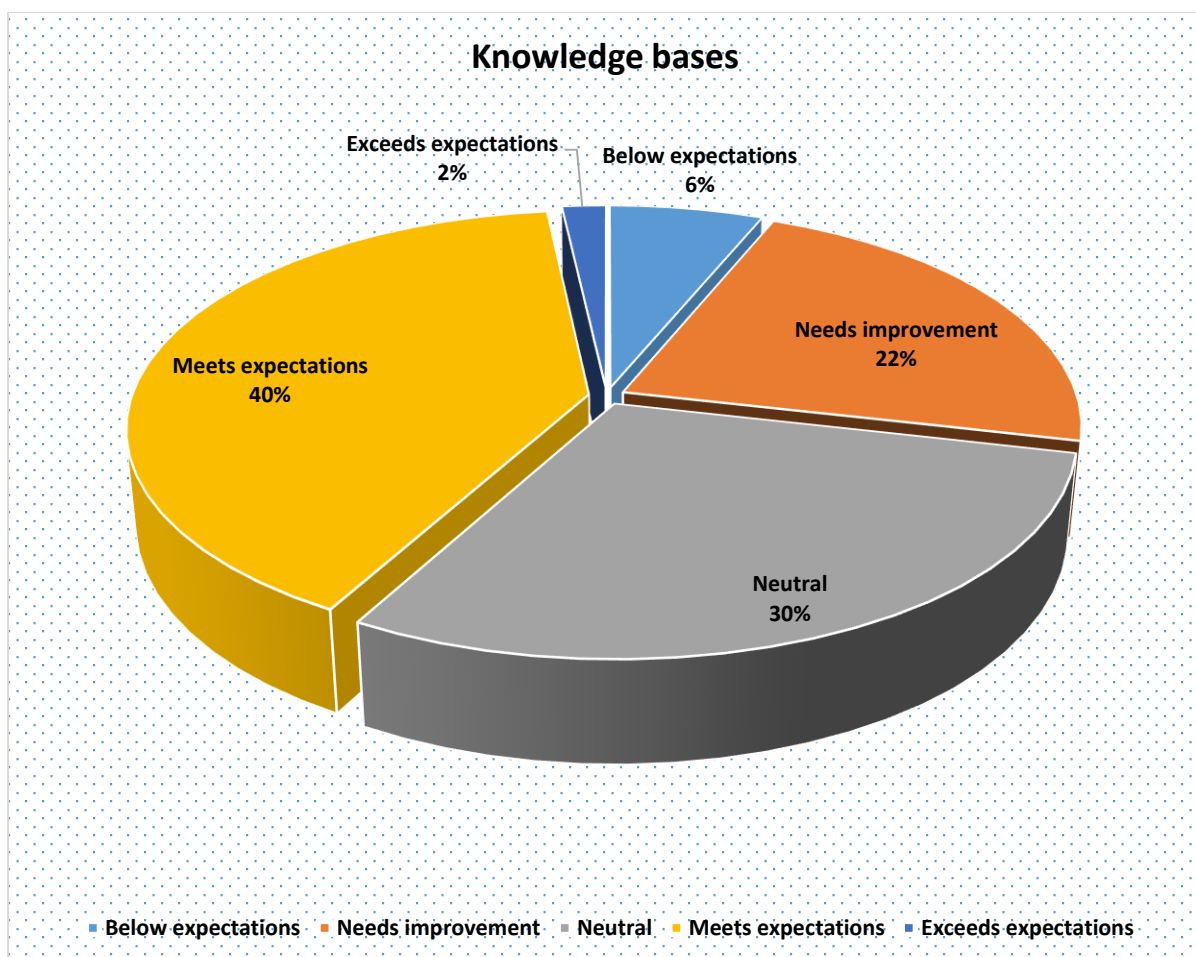
KM Tool	Below expectations	Needs improvement	Neutral	Meets expectations	Exceeds expectations
Knowledge bases	7 (6.3%)	25 (23.3%)	33 (29.4%)	45 (40.1%)	2 (1.8%)
Blogs	0 (0.0%)	21 (18.8%)	78 (69.6%)	13 (11.6%)	0 (0%)
Social networks	4 (3.6%)	17 (15.2%)	47 (41.9%)	41 (36.6%)	3 (2.7%)
Document libraries	5 (4.5%)	29 (25.9%)	66 (58.9%)	12 (10.7%)	0 (0.0%)
Collaborative virtual workspaces	0 (0.0%)	1 (0.8%)	20 (17.9%)	90 (80.3%)	1 (0.8%)
Brainstorming	4 (3.6%)	7 (6.3%)	57 (50.9%)	44 (39.2%)	0 (0.0%)
Storytelling	21 (18.7%)	17 (15.2%)	43 (38.4%)	26 (23.2%)	5 (4.5%)
Communities of Practice	7 (6.3%)	10 (8.9%)	15 (13.4%)	69 (61.6%)	11 (9.8%)
Collaborative physical workspaces	0 (0.0%)	12 (10.7%)	81 (72.3%)	16 (14.2%)	3 (2.7%)
Learning reviews	20 (17.9%)	34 (30.3%)	50 (44.7%)	4 (3.6%)	4 (3.6%)

According to the data gathered, the best IT tool to support KM was a collaborative virtual workspace which met expectations by 80.3%. On the other hand, the best non-IT tool to support KM was a CoP which met expectations by 61.6%. Participants have also shown that brainstorming is vital for KM with 50.9% considering it a neutral tool. Also, 72.3% of the participants were neutral on collaborative physical workspaces. This indicated that the physical workspaces partially met their needs. On the IT tools, the social network exceeded expectations by 2.7%. Storytelling was also found to be very important also in knowledge transfer. Figure 4.15 to 4.24 show the graphic presentation (pie charts) of the KM tools used in organisations with their relevance in the organisations studied.



### 4.9.1 Knowledge bases

Knowledge bases in organisations help people to create, collaborate and access new knowledge (APQC, 2010). Knowledge bases give a complete context for a topic by structuring the “what, why, who, where, when, how” and they do not require the IT department. Thus users can create their own knowledge bases and make use of them. The participants indicated that knowledge bases met their needs for knowledge sharing as indicated on **Figure 4.15** below:

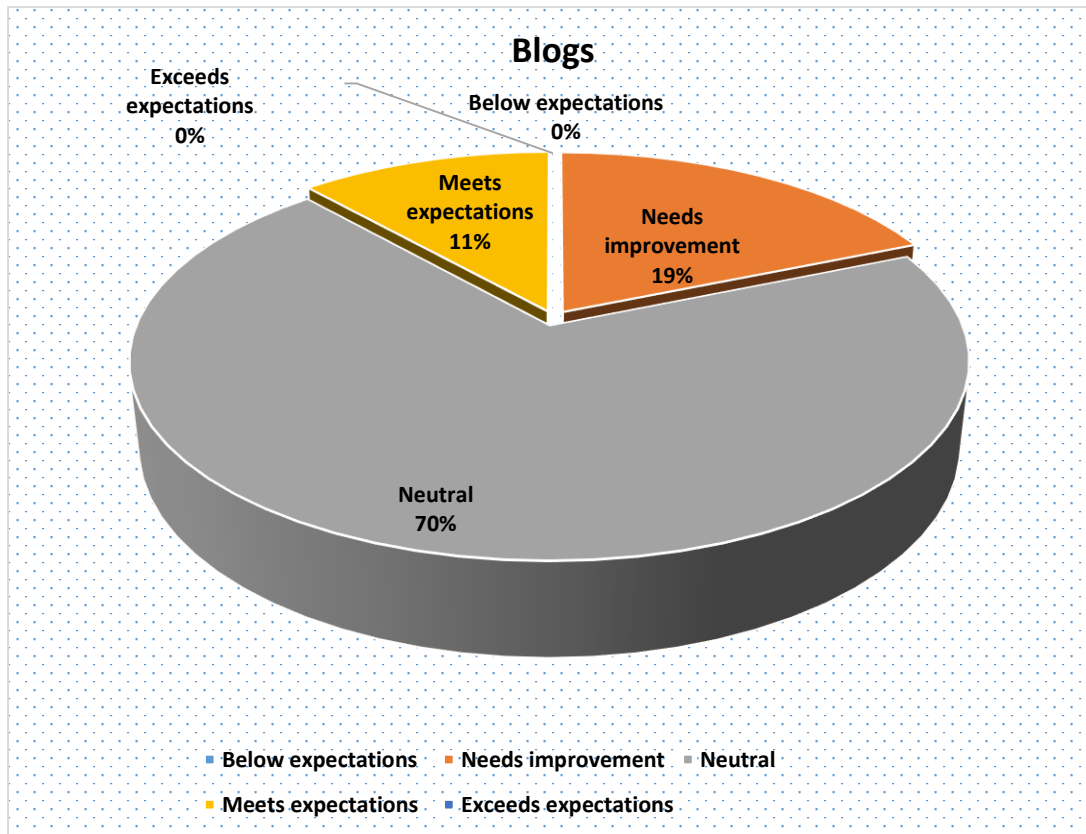


**Figure 4.15: Knowledge bases for knowledge sharing**

As can be seen from **Figure 4.15** above, 40% of the participants understood that a knowledge base meets their expectations for knowledge sharing. 30% of the participants were neutral on knowledge bases meeting their expectations. A very small percentage of 2% highlighted that knowledge bases exceeds their expectations while 22% of the participants were of the opinion that knowledge bases need improvement. Using a knowledge base starts by identification of what key area of knowledge is to be better managed in a knowledge base. Secondly, a knowledge base manager is appointed and then the knowledge base is created.

### 4.9.2 Blogs

Blogging is an appropriate tool for communicating, especially with a wider audience online. According to McHarry (2017) a blog is a simple 'journal style' website that consists of a list of entries, usually in reverse chronological order. This tool is widely used today for knowledge sharing and the participants' responses are shown in **Figure 4.16** below:

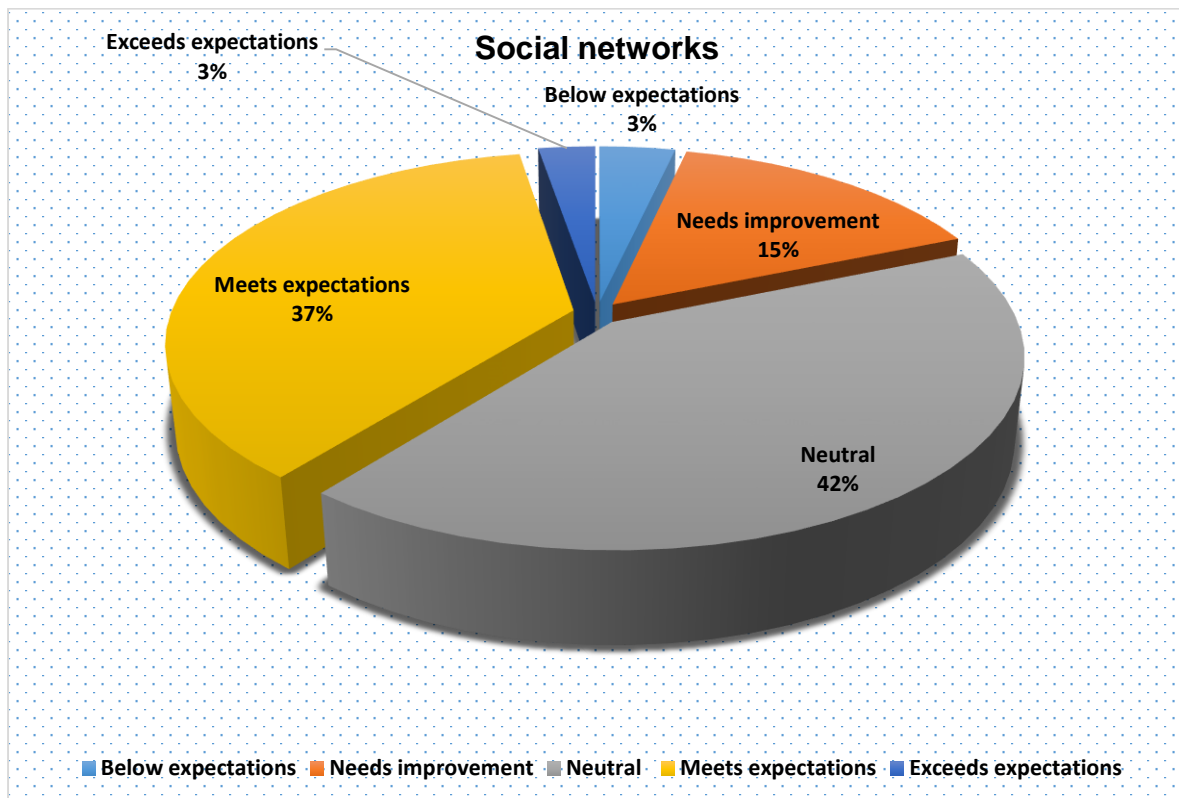


**Figure 4.16 Blogs for knowledge sharing**

11% of the participants confirmed that blogs meet their expectations of knowledge sharing. In this survey, 19% of the participants indicated that blogs need some sort of improvements so that they can meet their anticipations while 70% were neutral on blogs meeting their needs. There was no participant who considered a blog as below expectations as well as exceeding expectations. Most of the scores were median. Writing blog entries is a way of engaging in knowledge capture and sharing in KM (Rachael, 2016). Contemporary studies reveal that the blog contents could build up to become a valuable and searchable knowledge base.

### 4.9.3 Social networks

Social networks consist of groups of people who share a common area of interest and concern (Panahi, Watson & Partridge, 2012). The main services offered by social networks usually include finding people with similar interests and grouping those people into sets. Communication within these groups allow them to share both familiar and new content. Because knowledge is important to any organisation, there is need to have a social network that is specifically dedicated to knowledge sharing. The research participants largely supported the social network for knowledge sharing as presented below on **Figure 4.17**.

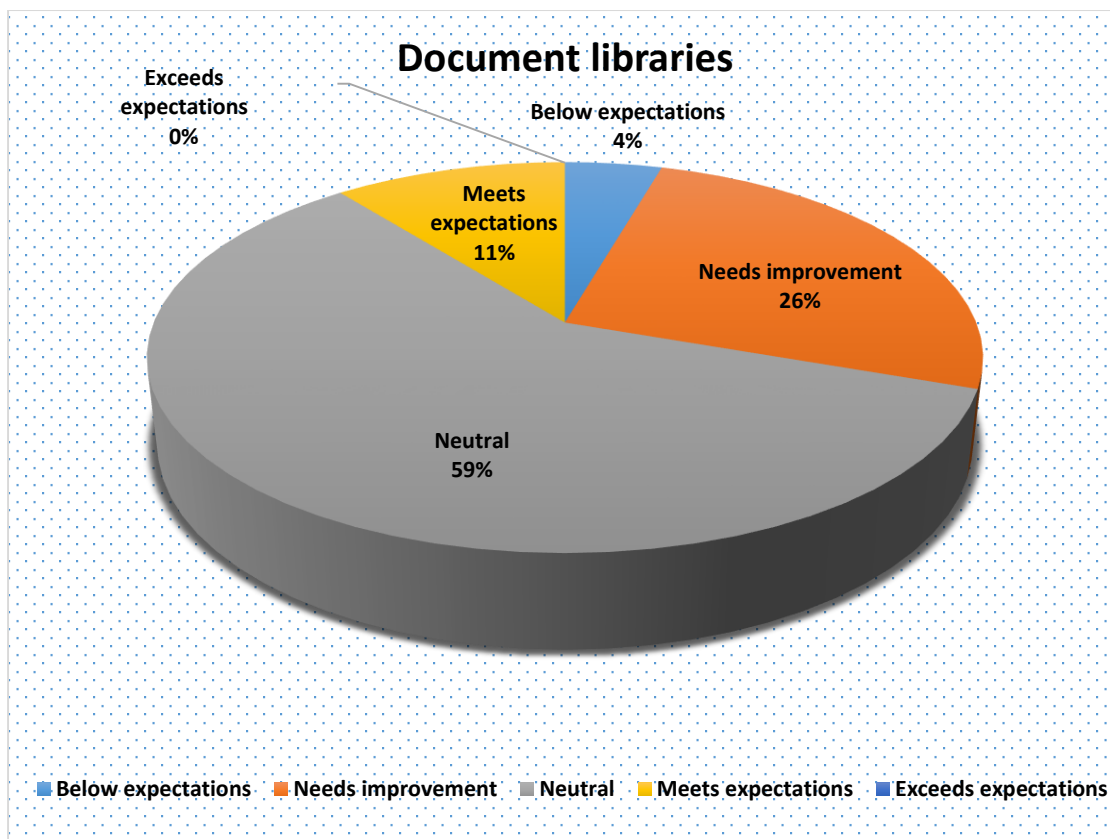


**Figure 4.17 Social networks for knowledge sharing**

A social network met user expectations by 37% and this is a significant percentage in KM practices. On the same platform, 42% of the participants were neutral on social networks meeting their needs. Only 15% of the participants considered that social networks need improvements because continuous process improvement is also a major goal of KM. 3% considered social networks below expectations and also exceeding expectations. Social networks are powerful knowledge-sharing tools especially in this technology-dependent era (Shah, Khan & Amjad, 2013). Examples of social networks include Facebook and LinkedIn which are amongst some of the most economic tools for knowledge sharing today.

#### 4.9.4 Document libraries

Well-organised and effective access to documents is the remedy to “information overload”. Maintaining a “document repository” with good categorisation is vital to searching and finding information on time. In a document library, documents can be organised, searched and listed under several categories. These documents could be hyperlinked and stored in standardised relational databases. On meeting user expectations, participants responded as shown on **Figure 4.18** below.

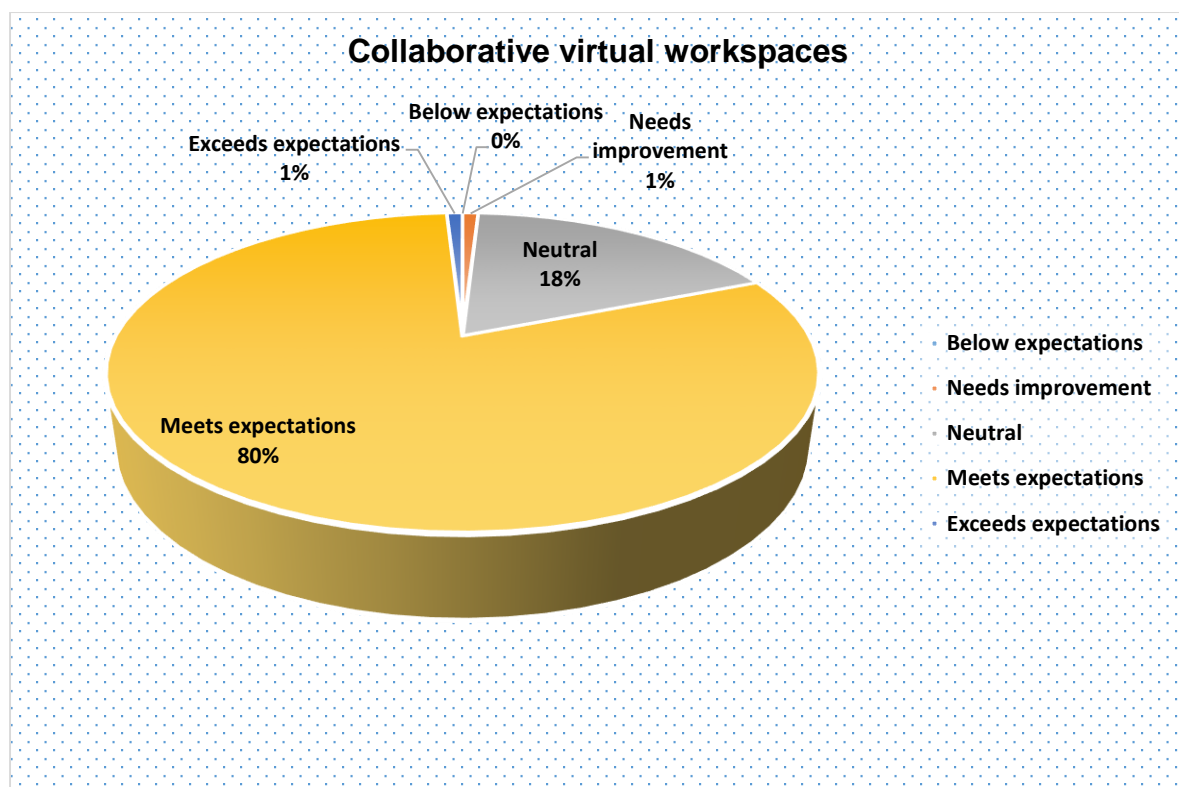


**Figure 4.18 Document libraries**

On this tool, 59% of the participants were neutral on document libraries meeting their expectations. So this confirms that some participants considered document libraries as useful tools for knowledge sharing. In addition, 26% considered document libraries as in need of improvements while 11% of the participants confirmed that document libraries meet their needs. There were no participants who considered document libraries exceeding expectations. These documents can be managed by owners and viewed by selected groups. Well-organised documents are the first step to effective KM and they can start simple making use of free tools, such as Google Docs, and progressively develop into sophisticated document management systems.

#### 4.9.5 Collaborative virtual workspaces

Collaborative virtual workspaces allow people to collaboratively work together, regardless of where they are physically located (Lesko et al, 2012). Collaborative virtual workspaces are a combination of document sharing, collaborative document editing and video conferencing. The use of virtual workspaces allow organisations to access the best skills everywhere in the world and this definitely reduces travel costs and permits people to work at their convenience. Responses from the participants are shown on **Figure 4.19** below:

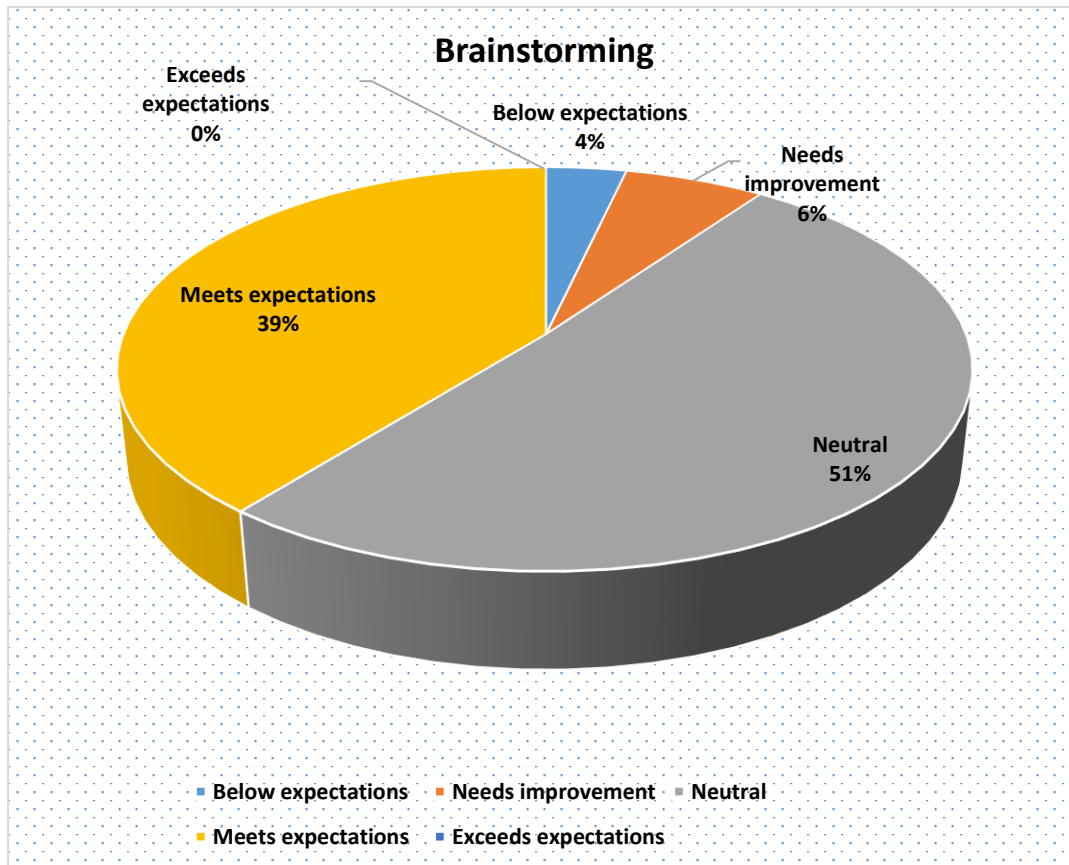


**Figure 4.19 Collaborative virtual workspaces**

80% of the participants highlighted that collaborative virtual workspaces meet their expectations. This means that users enjoy sharing information and knowledge with users scattered all over the world. It is interesting to note that 18% of the participants considered collaborative virtual workspaces as neutral while 1% was recorded on virtual workspaces exceeding expectations and in need of improvements. Virtual workspaces were never considered below expectations. Those participants who are not well acquainted with this tool should be trained for effective knowledge sharing and collaboration. According to IGI Global (2016), virtual workspaces are quickly becoming an important part of many organisations' work practices and this trend is likely to continue. The Internet connection speed, commonly known as bandwidth should be good for this tool to be user friendly.

#### 4.9.6 Brainstorming

Brainstorming is an interactive approach of assisting a group of people to generate new and unusual ideas (APQC, 2010). Brainstorming is appropriate when people need to generate a range of options that go beyond the obvious set. Participants responded as shown in **Figure 4.20** below to the question asked.

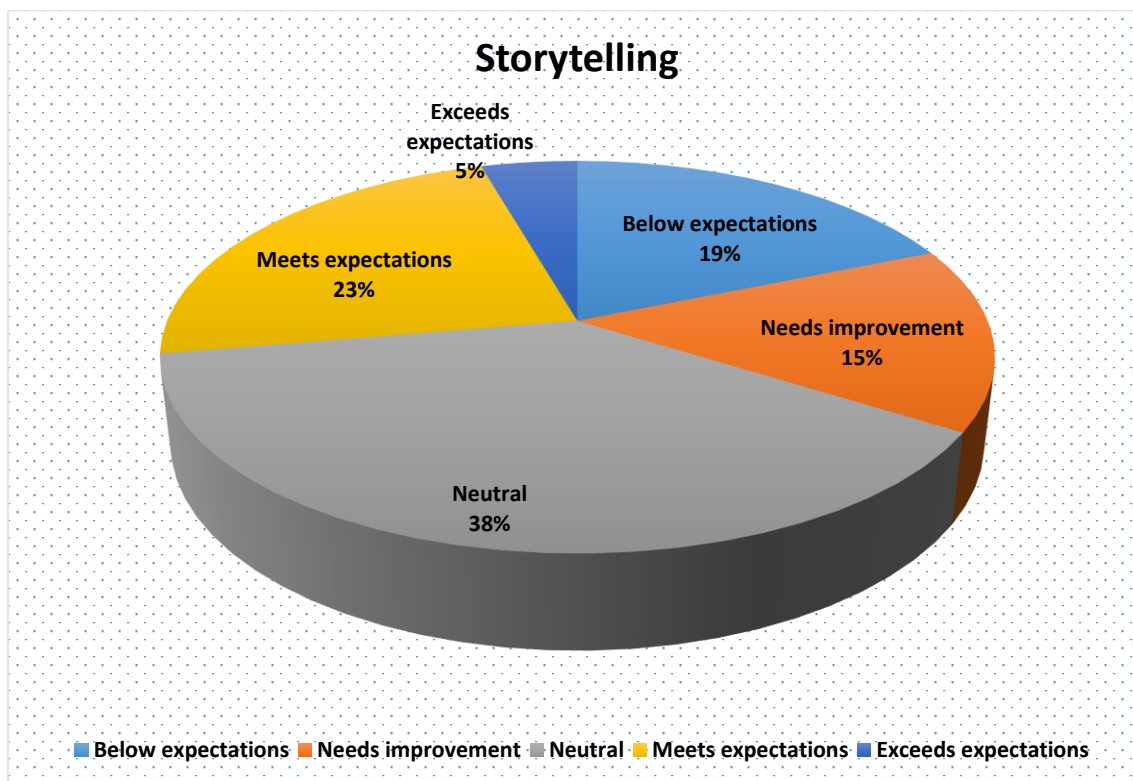


**Figure 4.20 Brainstorming**

Out of the 112 respondents, 39% of them underscored that brainstorming meets their expectations on knowledge sharing. In this survey, 4% of the participants considered brainstorming below expectations while 6% underlined that brainstorming needs improvements. Majority of the participants (51%) confirmed brainstorming a neutral tool for meeting their knowledge sharing needs. Brainstorming does not exceed the expectations of any of the participants. Brainstorming is not suitable when a problem is known to have a specific correct solution. Thus, brainstorming can be used in almost any situation where a group find space to work together (APO, 2010: 12).

### 4.9.7 Storytelling

Storytelling is one of the oldest KM tools which is still found to be useful even today (Dalkir, 2011). Storytelling is the conveying of events in words, images and sounds often by improvisation, narrative and at times dramatisation. Stories have been shared in almost every culture as a means of entertainment and education. In KM, storytelling has been used as a tool to share and transfer knowledge, especially tacit knowledge. Many organisations utilise storytelling to transfer experts' knowledge to novices and the participants in this study responded as shown on **Figure 4.21**. This is an indicator that storytelling is still helpful even in modern organisations.

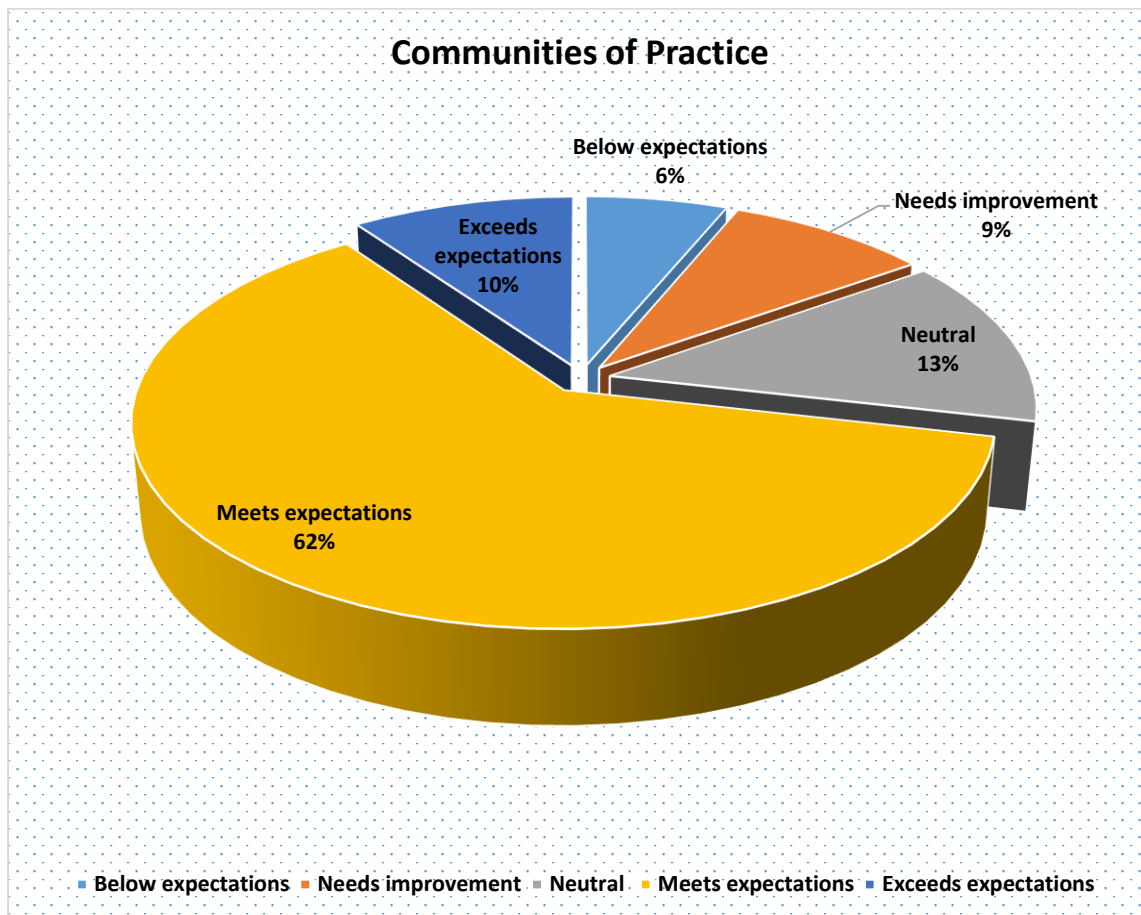


**Figure 4.21 Storytelling**

In this survey, 38% of the participants were neutral, followed by 23% of the participants who considered storytelling meeting their expectations. 19% highlighted that storytelling is below what they expect whilst the other 5% stressed that storytelling exceeds their expectations. Along the spectrum, 15% emphasised that storytelling requires improvement. Observations have revealed that storytelling is time-consuming for both storytellers and the audiences compared to IT systems. Because storytelling conveys much richer contexts through stories than other means, storytelling by a knowledgeable person in any field has the power to transfer tacit knowledge.

#### 4.9.8 Communities of Practice

CoPs are groups of people who share a common concern (Wenger, 2014). These COPs have play an important role in the context of KM especially for sharing common knowledge beyond formal departments. CoPs also work as tools to break down the barriers to knowledge flow across organisations (Jang & Ko, 2014). COPs can exist in a department of an organisation or across departments in an organisation, or even outside boundaries of multiple organisations, depending upon its objectives. Participants' responses are shown on **Figure 4.22** below:



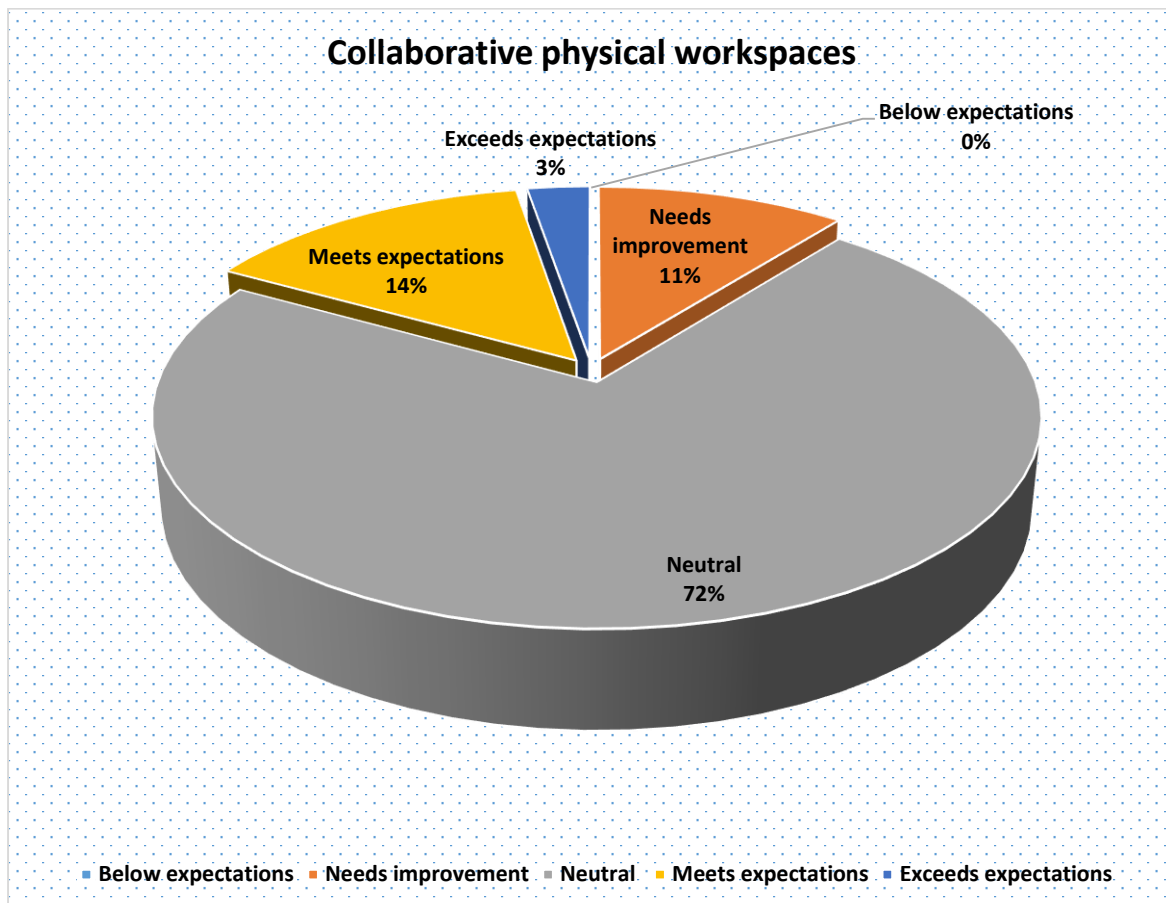
**Figure 4.22 Communities of Practice**

CoPs recorded 62% on meeting the user's expectations. More so, CoPs exceed the user expectations by 10%. Only 6% underlined that CoPs are below what they expect while 13% of the participants were neutral. 9% of the participants emphasised the need for improvements. COPs are generally for sharing skills, knowledge and expertise though there are also some COPs that mainly focus on innovation and generation of new knowledge. From these findings we can confirm that CoPs are powerful tools for effective KM.



#### 4.9.9 Collaborative physical workspaces

Collaborative physical workspaces are one of the top KM tools (APO, 2010). Physical workspace in the KM context means the physical aspects of our offices and other settings. When people share knowledge they interact normally through face-to-face meetings. A well-designed physical workspace can support knowledge creation and sharing. Depending upon the kind of interactive scenes an organisation needs, the design of physical workspaces differ from one organisation to another. Responses from the participants are shown in **Figure 4.23** below:

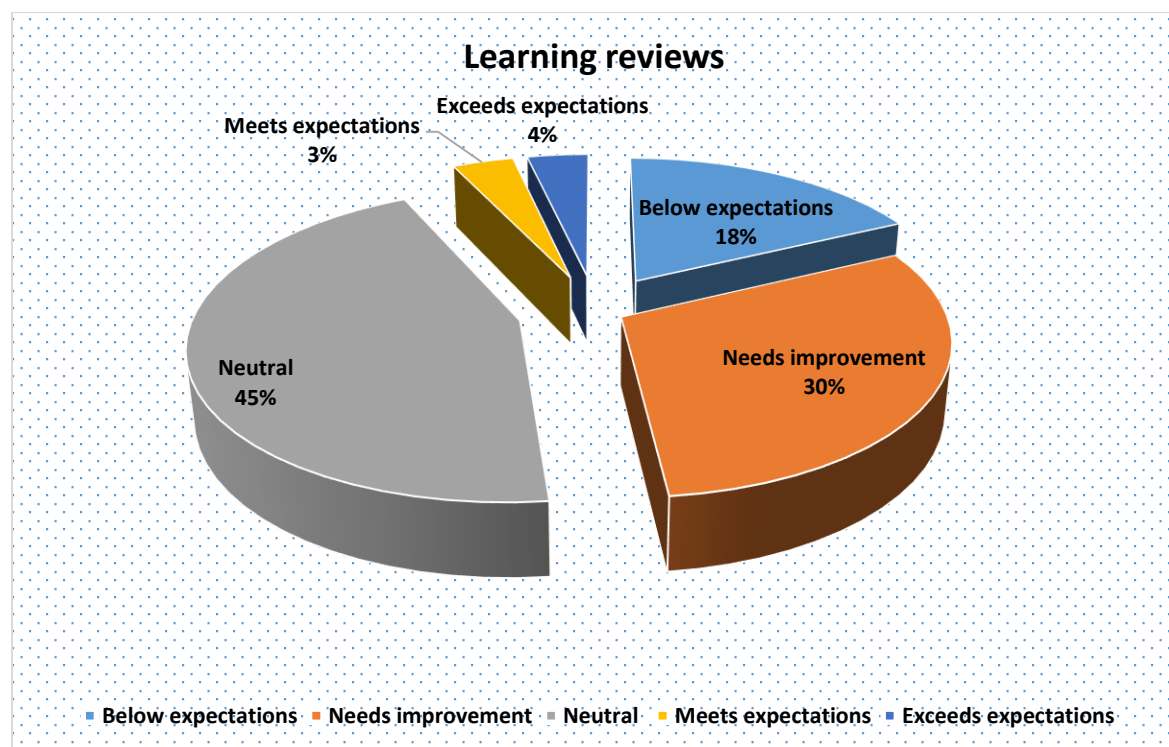


**Figure 4.23 Collaborative physical workspaces**

In this study, 72% of the participants were neutral in considering collaborative physical workspaces as helpful in sharing knowledge. More so, 14% underscored that physical workspaces meet their needs. There were no participants who indicated that physical workspaces were below user expectations. Only 11% were of the idea that physical workspaces need some improvements. Collaborative physical workspaces can be created for adhoc and formal interactions or specifically for team collaboration. Most organisations have boardrooms; however, a boardroom may not be a good place for teamwork.

#### 4.9.10 Learning reviews

Learning reviews enable project teams and individuals to learn during the work process (PMBOK, 2016). The main purpose of a learning review is for team members to constantly learn while carrying out a project. Under normal circumstances, projects are carried out without reflecting till the project is completed. Learning reviews enable team members to learn immediately from both failures and successes irrespective of the project duration. Participants' perceptions of learning reviews are shown on **Figure 4.24** below:



**Figure 4. 24 Learning reviews**

30% of the participants outlined that learning reviews need improvements while 45% were neutral on learning reviews meeting their expectations. The other 18% understood that learning reviews were below their expectations. Exceeding expectations recorded 4% and meeting expectations recorded 3%. Learning reviews should therefore be built into the allotted time frame so that they are not seen as an afterthought activity.

A closer analysis of the tools analysed here shows us that the best tool for knowledge sharing is a Community of Practice. The tool had the highest percentage of 10 on exceeding knowledge sharing expectations. Depending on the organisational structure and culture in place, KM tools may differ. Having discussed and analysed these tools for KM, the report moves on to analyse the role of social media for effective Knowledge Management.

## 4.10 Analysing the role of social media for KM

This section of the research addressed the seventh objective which sought to analyse the importance of social media in the KM context. Social media is developing at a phenomenal rate and has become a pivotal activity which generates new possibilities through collaboration (Holmes & Harwood, 2011). Organisations are paying specific attention to effective knowledge sharing, which is of paramount importance for their success in this globally competitive environment.

### 4.10.1 Social media platforms

The following social networks are used for knowledge sharing among others:

- Facebook
- Skype
- Twitter
- LinkedIn
- Myspace

Social media bridges the divides between employees and companies. As a matter of fact, social media has broken the time and space barriers, bringing everyone together in virtual reality. **Table 4.15** below shows the responses obtained from the participants in response to the question “Which of the following social media do you consider best for knowledge sharing in your organisation?”

**Table 4.15 Best Social Media for KM**

Social Network	Number of participants	Percentage
Facebook	6	5.4%
Skype	27	24.1%
Twitter	16	14.3%
LinkedIn	61	54.5%
Myspace	2	1.8%

LinkedIn was considered as the best platform for KM with 54.5%. This was followed by Skype with 24.1% and then Twitter with 14.3% of the participants. Facebook and Myspace had both less than 10% of the participants. Because LinkedIn is always used to connect professionals, the highest percentage was recorded as all the participants were professionals with academic degrees in various disciplines. LinkedIn is different from other social sites as it is designed specifically for professional networking where the participants connect with only those who demonstrate significant competencies in their specific discipline.

The social media platforms have different strengths and weaknesses depending on the individual and whether the platform is used at individual or organisational level (Massaro et al, 2014). Facebook is considered less effective by professionals because it is used by almost everyone who has Internet access for sharing different kinds of information which may not specifically benefit the organisation (Shah & Khan, 2013). Studies by Mesquita & Peres (2015) on the impact of social media on life revealed that Facebook has a problem of addiction which might end up in loss of productivity if users spend more time online.

Other social media tools like Skype have video chat which allows members to get a chance for face-to-face experiences. Twitter and Myspace were used by less professionals at the organisations studied as evident on the data in **Table 4.15** on page 138. The reasons why these platforms are little used may lie in their strengths and weaknesses to achieve user goals of knowledge sharing. According to Mazarakis & Peters (2015), Myspace's major limitation is that there are many falsely identified users who are threats to system security. However, Myspace has the strength of user-friendliness.

Interviews (**Appendix 3**) were also used to determine the role of social media for knowledge sharing. A total of 11 interviews were held with HODs and managers. Only two questions were asked during the interviews to address the role of social media for KM:

Which social media do you use for sharing information?

Do you see the social media platform you use as important for knowledge sharing?

The data analysed using content analysis revealed that most interviewees (73%) use LinkedIn for knowledge sharing. To be specific, 8 out of 11 participants mentioned that they use LinkedIn for knowledge sharing. These qualitative findings corroborate with the quantitative findings. This could be because LinkedIn is used mostly by professionals and all the interviewees were qualified and experienced professionals. Having analysed these social media tools this report moves on to the individual ranking of participants' views on social media, specifically its value in organisations for KM.

#### 4.10.2 Analysis of the organisational roles of social media

There were different views on the role social media for KM from an organisational perspective. In **Table 4.16** below, the number outside the brackets signifies the actual number of participants and the figure inside the brackets represents the respective percentage of the participants in response to statements connected to social media for KM. Participants were asked to rank the statements taking into consideration the following categories.

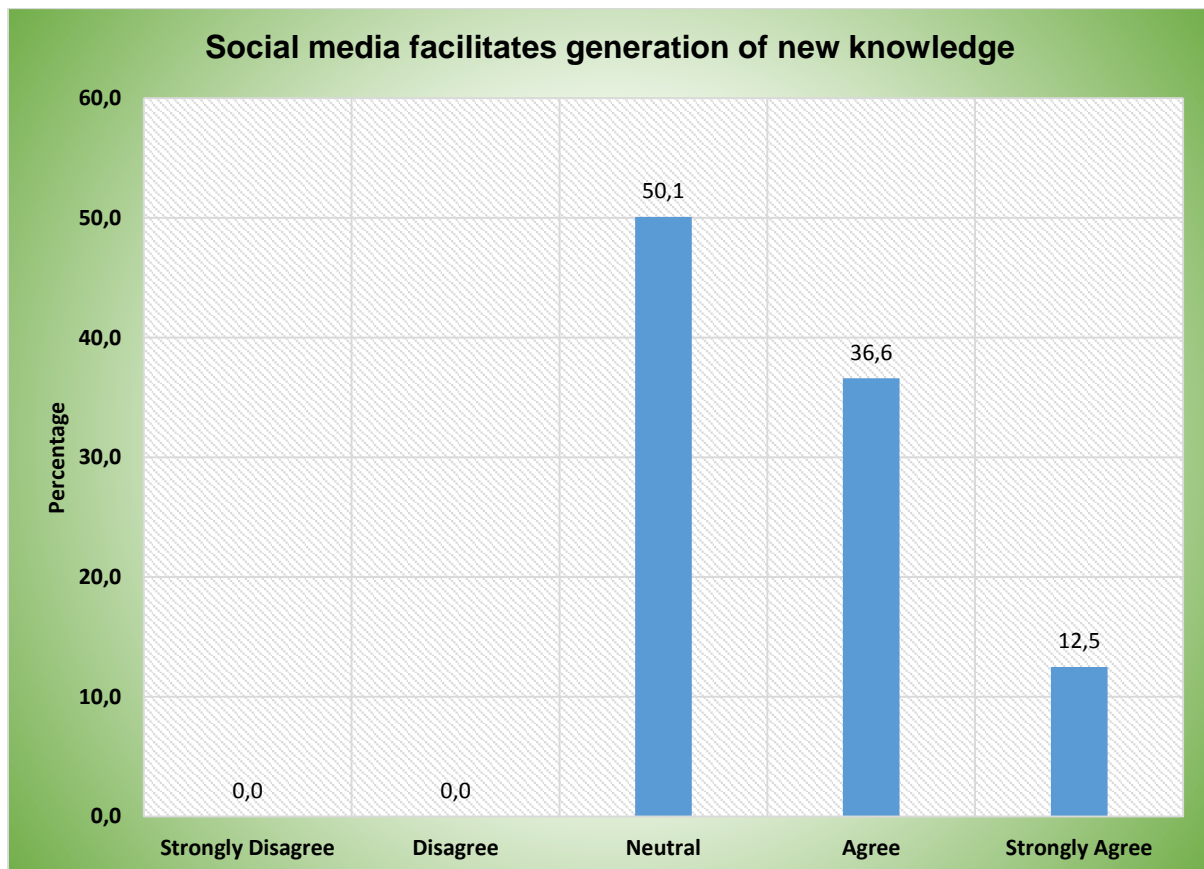
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

**Table 4.16- Social media for KM**

Social media statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Social media facilitates generation of new knowledge	0 (0.0%)	0 (0.0%)	57 (50.1%)	41 (36.6%)	14 (12.5%)
Junior employees will easily acquire tacit knowledge	0 (0.0%)	6 (5.4%)	23 (20.5%)	78 (69.7%)	5 (4.5%)
Senior employees will get recognition of their knowledge base	0 (0.0%)	0 (0.0%)	33 (29.5%)	52 (46.4%)	27 (24.1%)
Senior staff will continually upgrade their knowledge with new developments	3 (2.7%)	9 (8.0%)	69 (61.6%)	29 (25.9%)	2 (1.8%)
Social media promotes a knowledge sharing culture	0 (0.0%)	0 (0.0%)	37 (33.0%)	71 (63.4%)	4 (3.6%)

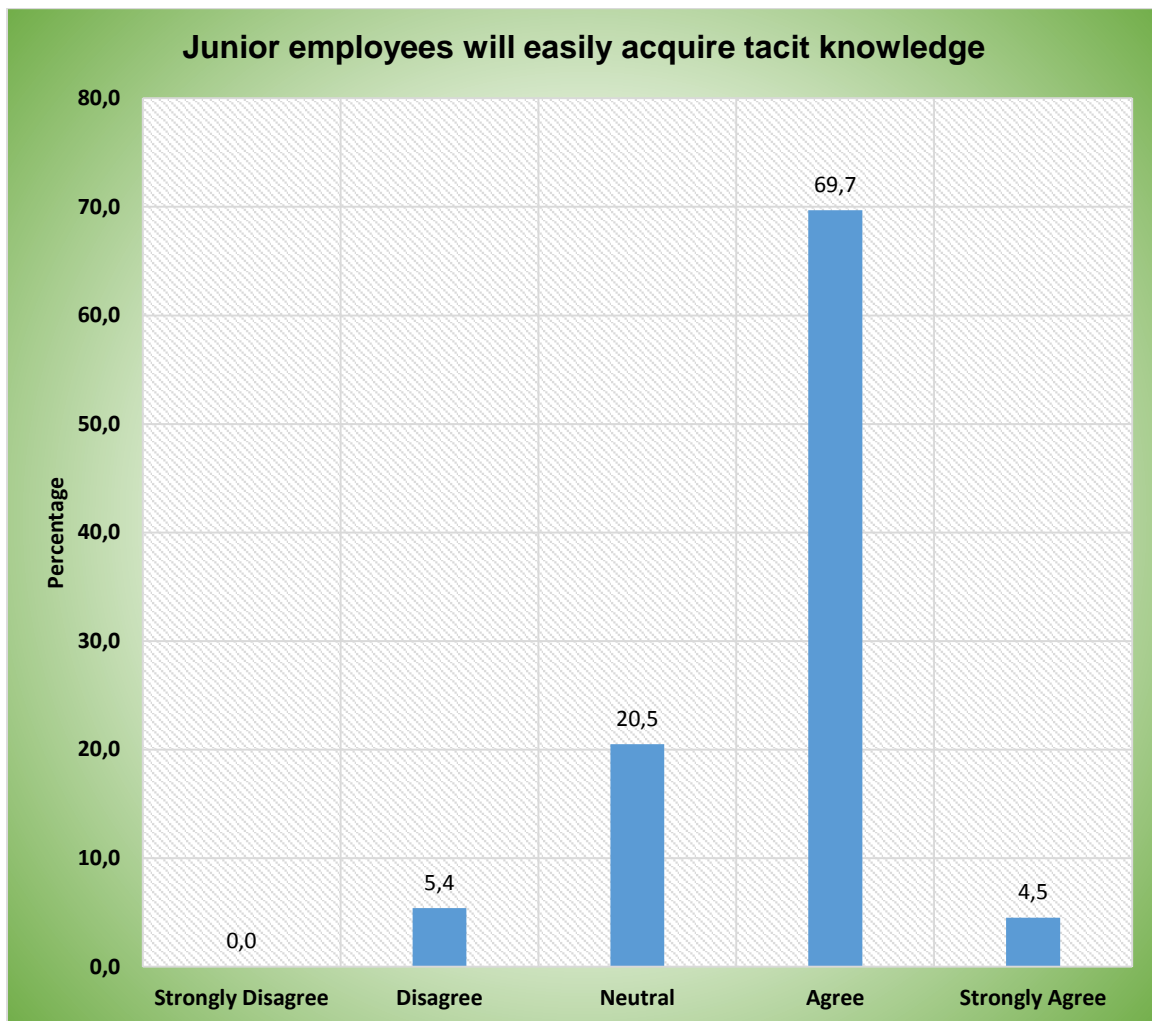
It emerged from the data that 36.6% of the participants agreed that social media facilitates generation of new knowledge. Interestingly, 50.1% of the participants were neutral on social media facilitating generation of new knowledge. On the same construct, 12.5% of the participants strongly agreed that social media assists in the generation of new knowledge in an organisation. 69.7% of the participants agreed that junior employees would easily acquire tacit knowledge while 4.5% strongly agreed with the statement that social media allows junior employees to obtain tacit knowledge. On senior employees getting recognition of their knowledge base, 46.4% agreed, 24.1% strongly agreed and 29.5% of the participants were neutral.

25.9% of the participants agreed that senior staff would continually upgrade their knowledge with new developments on social media. Also, 61.6% of the participants were neutral on senior staff upgrading their knowledge. 8% of the participants disagreed that senior staff would continually upgrade their knowledge with new social media developments. Most importantly, 63.4% of the participants agreed that social media promotes a knowledge sharing culture. There were no participants who disagreed that social media supports a knowledge sharing culture. These statements were analysed individually and presented graphically on **Figure 4.25** to **Figure 4.29** in an effort to find how useful social media is for KM in organisations.



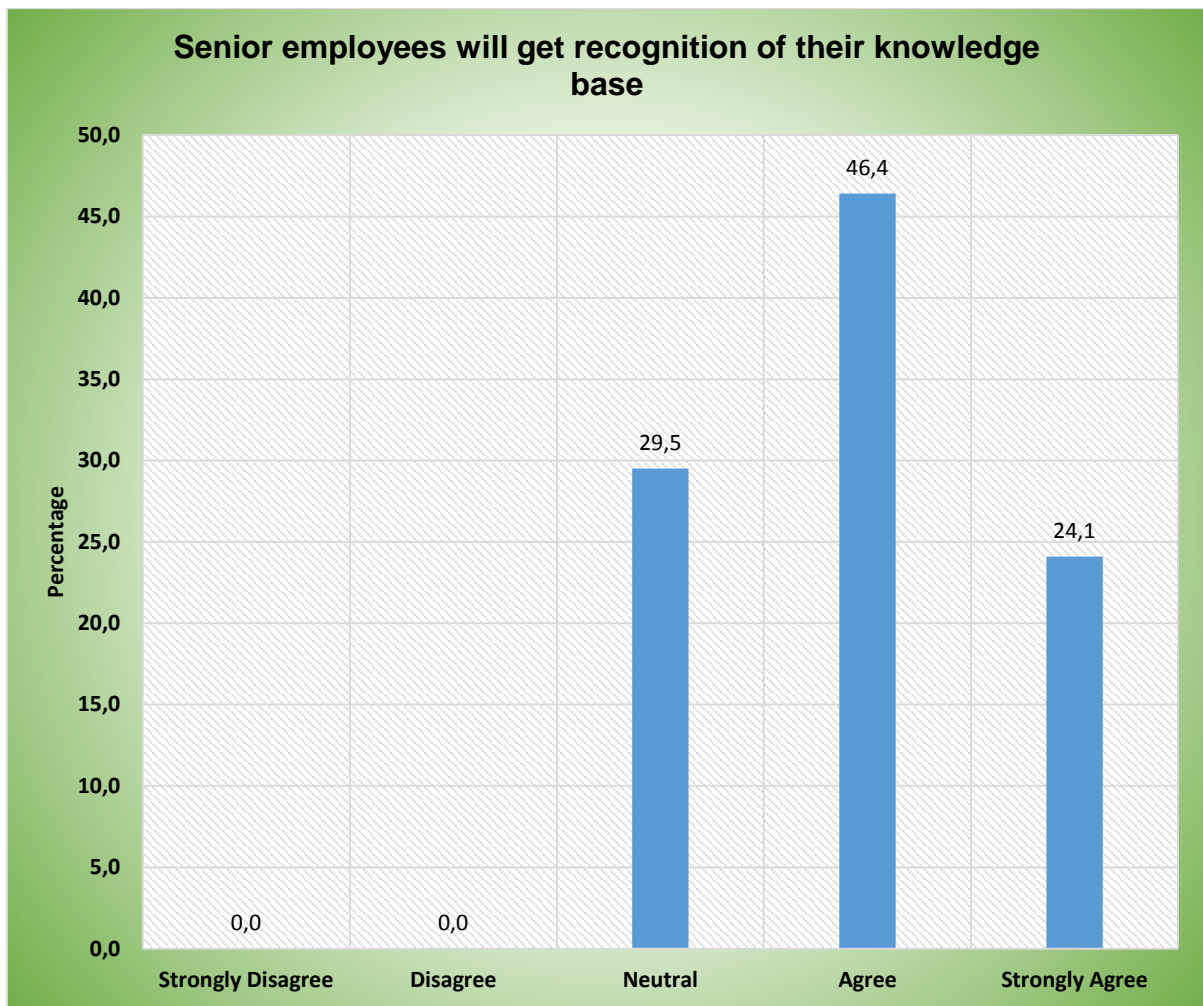
**Figure 4.25: Social media for generation of new knowledge**

**Figure 4.25** above clearly shows that social media facilitates generation of new knowledge as also found by Gaal et al (2015). All participants were in support of this idea, and all their views were on the positive side, either agreeing or strongly agreeing. Thus social media can be seen as a conduit to the generation of new knowledge. After the knowledge has been generated, it must flow to others and be acquired by junior staff to boost productivity in organisations. **Figure 4.26** on the next page shows that junior employees can make use of social media to acquire tacit knowledge.



**Figure 4.26: Acquiring tacit knowledge**

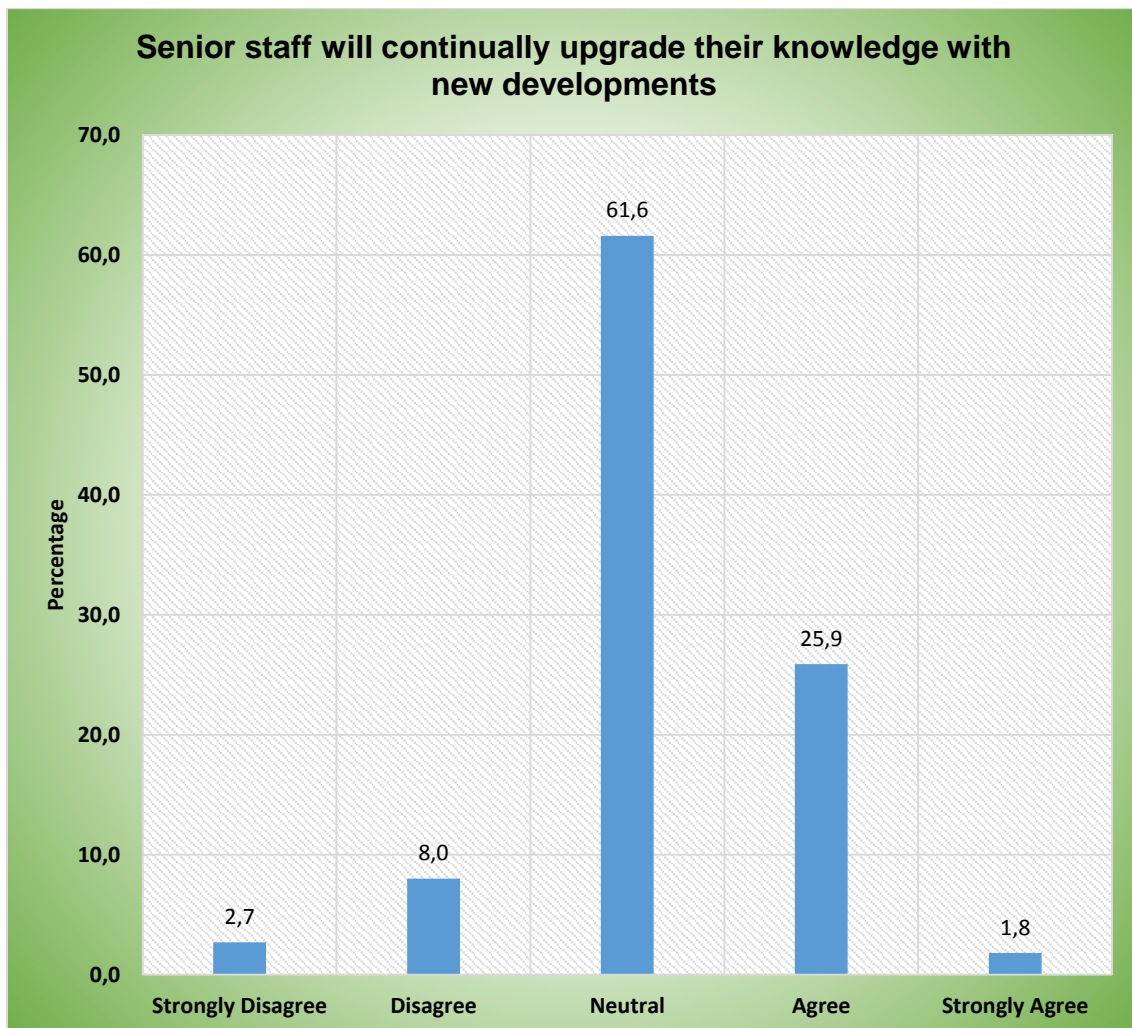
It is well-known that tacit knowledge is difficult to communicate, write down, visualise or transfer from one person to another (Young, 2013; Girard & Girard, 2015; Liu, 2016). Tacit knowledge cannot be captured by a language or mathematical formulae because it is elusive in nature. Making use of social media could definitely assist young staff to also acquire this tacit knowledge. These junior staff are likely to utilise the available social media tools at their disposal for individual and organisational benefit. A significantly huge percentage of 69.7% agreed that social media aids in acquiring tacit knowledge. This tacit knowledge is gained mainly through experience and senior staff would like to be recognised for that as shown on **Figure 4.27** on the next page.



**Figure 4.27: Recognition of employees for their knowledge base**

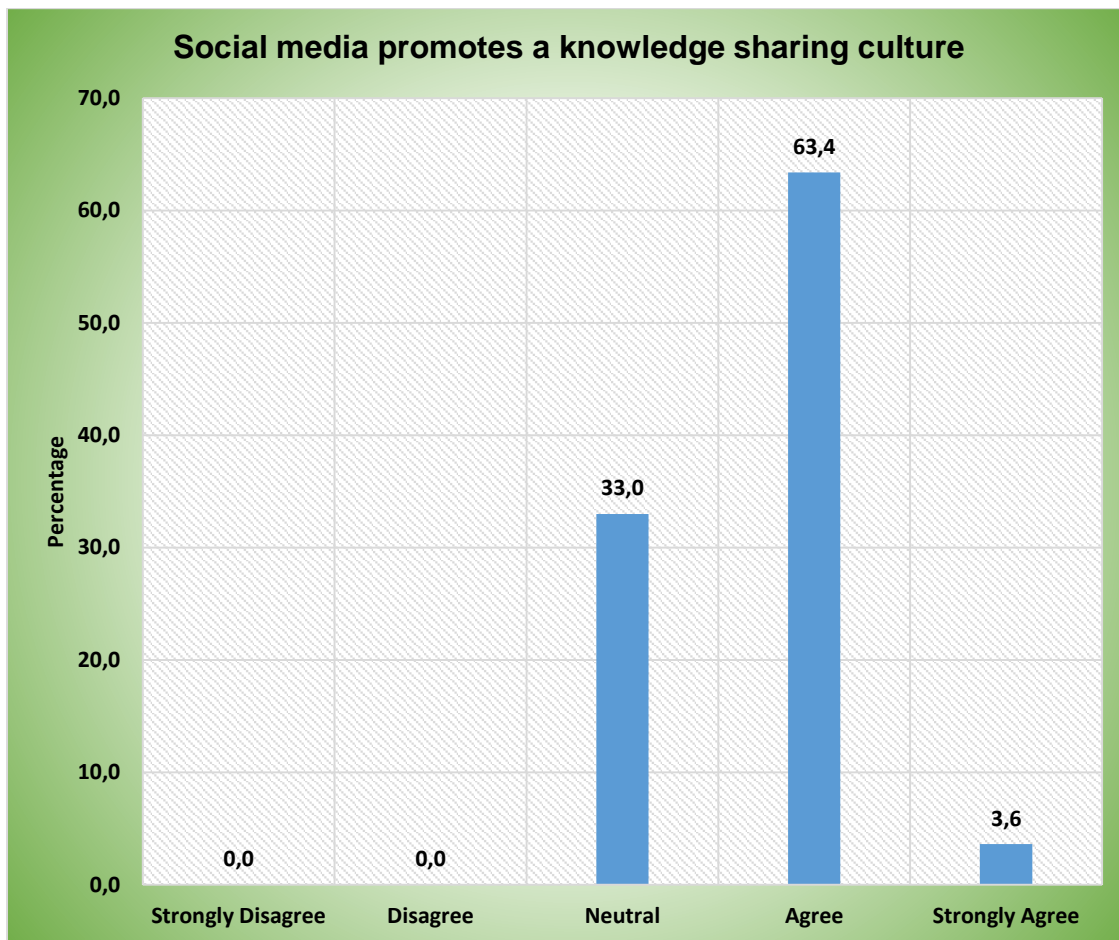
Recognition is very important especially in the KM discipline (Omotayo, 2015). Because it is so important, 46.4% of the participants agreed that social media assists senior staff get recognition of their knowledge bases. This is quite true even on social media platforms like LinkedIn where people are endorsed and recommended for their exceptional skills. All the participants were also on the positive side that social media gets senior employees recognised. This recognition can be at individual, departmental or organisational level. It is a general principle that creating knowledge has to be recognised. Because technology is constantly changing, senior staff are likely to continually upgrade their knowledge with new developments in social media as shown on **Figure 4.28** on the next page.





**Figure 4.28: Upgrading knowledge with new developments**

In the past, knowledge used to be created and stored, but now new knowledge created is used for innovation and continuous process improvement. Social media allows senior staff to continually upgrade their knowledge with new developments. 61.6% of the participants were neutral on this premise whilst 25.9% agreed to the proposition. Social media makes knowledge iterative, thus promoting learning (Chan, 2013). A knowledge sharing culture in any organisation describes the norms and values that the organisation's members share in common. The ultimate goal of social media is to promote a knowledge sharing culture as shown on **Figure 4.29** on page 145.



**Figure 4.29: Promotion of a knowledge sharing culture through social media**

The core process of KM is knowledge sharing which could be done through the use of social media (AlRashidi & Srinivas, 2016). From the respondents, 63.4% of the participants (as shown on Figure 4.29 above) agree that social media promotes a sharing culture. Sharing especially on social media involves socialisation and exchange. 3.6% of the participants strongly agreed on the premise that social media is important for knowledge sharing specifically in this technology dependent environment. Knowledge sharing on social networks is an important means through which employees contribute to knowledge application and innovation in their respective organisations. Having recognised the role of social media for KM, this report moves on to analyse the relationship between IT and KM since KM is partially supported by Information Technologies.

#### 4.11 Relationship between Information Technology and KM

IT is considered as a catalyst for effective and efficient KM in modern organisations. ICTs provide platforms for knowledge capture, sharing and storage (Song, 2007). The key function of IT in KM is to help people share knowledge on common platforms. Proper training in these technologies may allow organisations to acquire, store and disseminate such knowledge. The statements in **Table 4.17** below and **Table 4.18** on the next page sought to find out whether the participants agree with the propositions or not. The responses were either Yes or No. Out of the 112 questionnaires returned we found out the following responses.

**Table 4.17 Relationship between IT and KM**

Statements on IT	Yes	No
IT facilitates knowledge transfer through e-learning and blended learning	58 (52%)	54 (48%)
IT provides a platform for communication and cooperation, message exchange and collaborative work	106 (95%)	6 (5%)
IT facilitates knowledge integration including data evaluation, analysis and aggregation	68 (61%)	44 (39%)
IT improves knowledge search using search engines	112 (100%)	0 (0%)
IT enables knowledge presentation using different tools	75 (67%)	37 (33%)
IT assists administrative functions of reporting and management	90 (80%)	22 (20%)
IT provides publication, structuring and linking tools	89 (79%)	23 (21%)
IT facilitates knowledge sharing in organisations	103 (92%)	9 (8%)

IT partially supports KM in an endeavour to meet the KM objectives. 52% of the participants agreed that IT facilitates knowledge transfer through e-learning and blended learning. 95% of the participants understand that IT provides a platform for communication and cooperation, message exchange and collaborative work. Most significantly, all (100%) the participants indicated that IT improves knowledge search using search engines and 67% of the participants also agree that IT enables knowledge presentation using different tools. IT assists administration functions as recognised by 80% of the respondents and also publication tools which was identified by 79%. Participants also stressed that IT facilitates knowledge sharing seen at 92% of the respondents. 48% of the participants highlighted that IT does not facilitate knowledge transfer through e-learning and blended learning.

**Table 4.18 Relationship between KM and IT**

Statements on KM	Yes	No
a) Successful KM in organisations requires good ICT infrastructure	67 (60%)	45 (40%)
b) Creating a “knowledge sharing culture” in an organisation can be enabled by social media, which is an IT tool	92 (82%)	20 (18%)
c) KM facilitates knowledge acquisition and sharing of ideas through knowledge repositories	79 (71%)	33 (29%)
d) Most modern Communities of Practice are now Information Technology based	98 (88%)	14 (12%)
e) Team collaboration, groupware and sharing of information on best practices databases is enabled by ICTs	63 (56%)	49 (44%)
f) KM approaches make use of communication and information sharing tools	84 (75%)	28 (25%)
g) KM is implemented using ICT tools like knowledge portals which are web-based	57 (51%)	55 (49%)
h) KM can be strengthened by Web 2.0 tools like Dropbox, Google Docs and Wikis	72 (64%)	40 (36%)

It is interesting to observe that 60% of the participants concurred that successful KM in organisations requires good ICT infrastructure. In contrast, 40% did not agree that KM require good ICT infrastructure. Creating a “knowledge sharing culture” in an organisation can be enabled by social media, and 82% of the participants surely agreed to this. More than 70% of the respondents supported the idea that KM facilitates knowledge acquisition and sharing of ideas through knowledge repositories. Also, 88% of the participants concur that most modern CoPs are now IT-based. Team collaboration, groupware and sharing of information on best practices databases is enabled by ICTs and 56% of the participants viewed this as true.

Majority of the participants agree that implementation of KM using ICT could be strengthened by Web 2.0/3.0 tools like Dropbox, Wikis and Google Docs. 36% confirmed that KM cannot be strengthened by Web tools. The relationship between IT and KM was therefore analysed statistically using Pearson's product moment correlation, which is a measure of the linear relationship between two variables and has a value between -1 and +1 (Buda et al, 2010). The following section describes and analyses this relationship.

#### 4.11.1 Data analysis using Pearson's product moment correlation

Pearson's  $r$  cannot identify relationships that are not linear. Various authors like Buda & Jarynowski (2010) and Hinkle et al (2013) have offered different guidelines for interpreting correlation coefficient. Thus, the correlation depends on the purpose and context. **Table 4.19** below shows the responses from the participants which were used to calculate the correlation coefficient. Only positive responses were used from the Yes/No questions in **Table 4.17** and **Table 4.18** on page 146 and 147 respectively.

**Table 4.19 – Percentages of positive responses**

Information Technology	Knowledge Management
52	60
95	82
61	71
100	88
67	56
80	75
79	51
92	64
<b>PMC =</b>	<b>0.585490812</b>

Pearson's product moment correlation,  $PMC = 0.585490182$  which the researcher rounded off to 0.6. Comparably, the findings of this study show a 0.6 correlation between IT and KM which is actually a strong relationship. Pearson's formula is quite complex for a non-statistician, and in this case a simple Excel function was used to find the relationship, thus **=PEARSON (F5:F12; G5:G12)**. This suggests that IT and KM should be blended together so as to realise the knowledge sharing goals in organisations. It is clear from the data analysed in **Table 4.19** above that there is a relationship between IT and KM and we can comprehend that these two work hand in hand. Information Technology influences Knowledge Management and the other way round.

## 4.12 Analysing the effectiveness of the knowledge transfer activities

Measuring the usefulness of knowledge transfer activities is essential so that the best activities can be selected and embedded in the organisational structures and processes. KM should result in complete organisational transformation which involves redesigning and redefining business processes. Knowledge transfer activities allow sharing of knowledge and providing inputs to problem solving in organisations. The participants responded as follows to the questions asked, which sought to measure the usefulness of the knowledge transfer activities in their organisations.

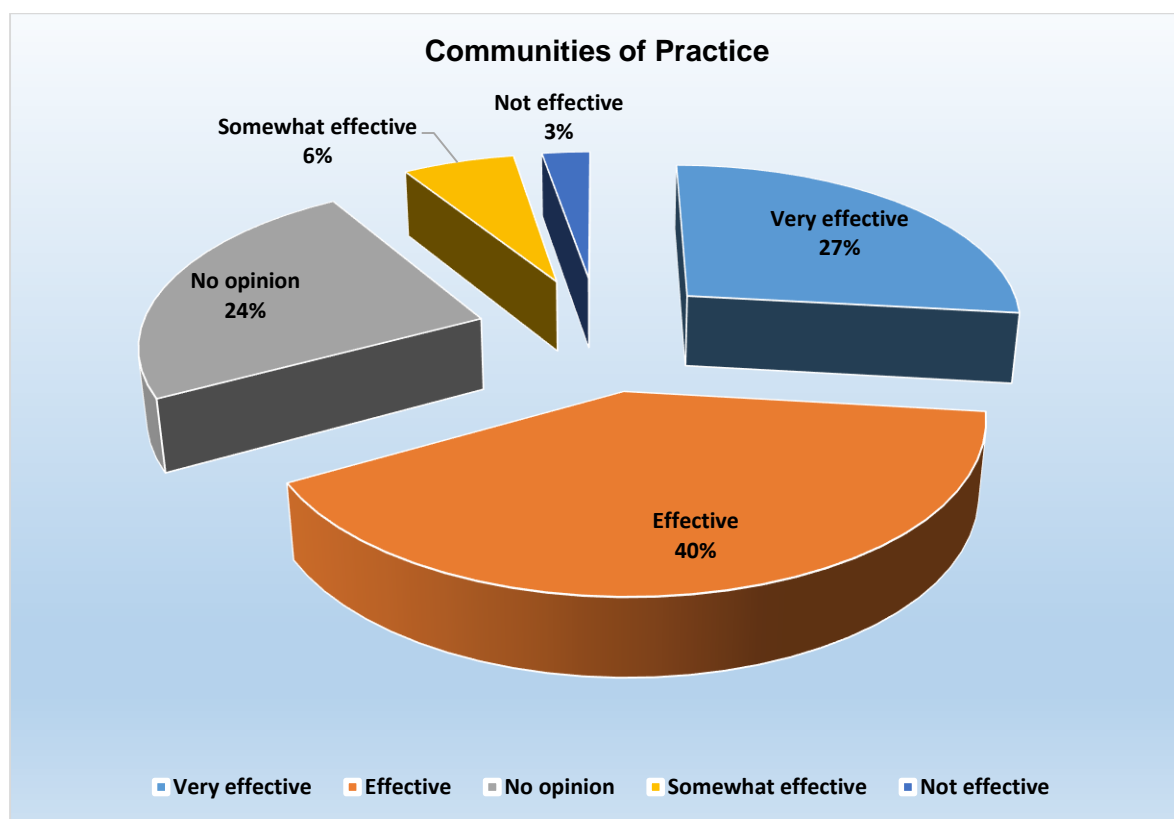
**Table 4.20 – Effectiveness of knowledge transfer activities**

Knowledge transfer activity	Very Effective	Effective	No opinion	Somewhat effective	Not effective
Communities of Practice	30 (27%)	45 (40%)	27 (24%)	7 (6%)	3 (3%)
Succession planning	13 (12%)	24 (21%)	42 (38%)	4 (4%)	29 (26%)
Coaching	5 (5%)	16 (14%)	63 (56%)	17 (15%)	11 (10%)
Storytelling	19 (17%)	31 (28%)	21 (19%)	34 (30%)	7 (6%)
Knowledge repositories	8 (7%)	6 (5%)	82 (73%)	16 (14%)	0 (0%)
Mentorship	12 (11%)	61 (54%)	25 (22%)	14 (13%)	0 (0%)
Job rotation	20 (18%)	19 (17%)	48 (43%)	13 (12%)	12 (11%)
Selection on appointment	0 (0%)	10 (9%)	57 (51%)	33 (29%)	12 (11%)
Keenness to share knowledge	1 (1%)	25 (22%)	50 (45%)	31 (28%)	5 (4%)
Adaptability to organisational culture	8 (7%)	23 (21%)	37 (33%)	15 (13%)	29 (26%)

According to the data in **Table 4.20** above, the most effective knowledge transfer activity is a CoP which was classified as very effective by 27% of the participants. This was followed by job rotation which was also ranked as very effective by 18%. Storytelling and mentoring have also proved to be very effective as indicated in the table. The following sections present and analyse the information in **Table 4.20** above in the form of charts for each knowledge transfer activity.

#### 4.12.1 Communities of Practice

According to the data gathered from the participants and presented on **Figure 4.30** below, CoPs were found to be effective for knowledge transfer in organisations by 40%. This was followed by 27% of the participants who considered CoP as very effective. 24% had no opinion on the effectiveness of CoPs. 6% and 3% considered CoP as somewhat effective and not effective respectively. Considering a CoP 40% effectiveness as adjudged by the participants might mean that the members to some extent share a common sense of purpose.

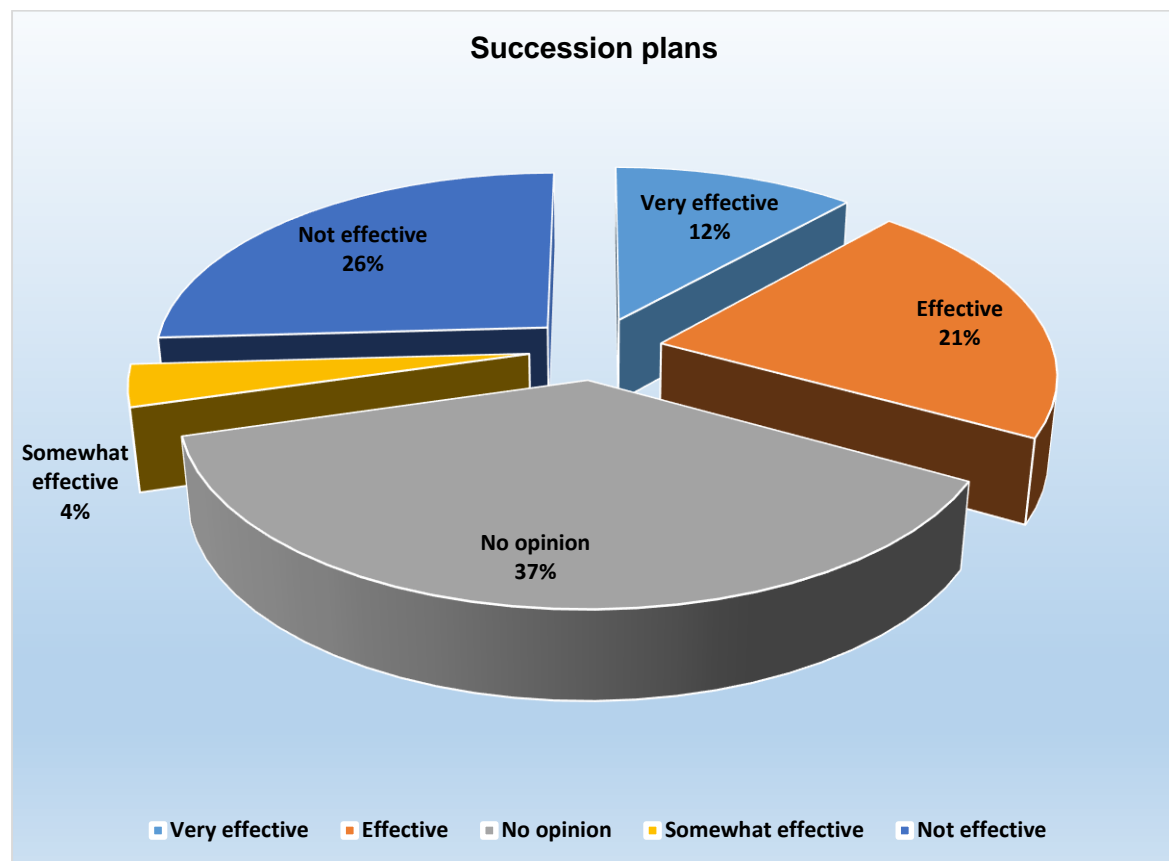


**Figure 4.30 Communities of Practice as a knowledge transfer activity**

According to Jang & Ko (2014), knowledge assessment determines the need for a CoP. Communities of Practice objectives should be established and linked to the organisational objectives. Membership penetration and growth should be analysed in a CoP to see how the community has grown. A knowledge transfer activity does not assess whether learning occurs, for example, replies to a discussion forum or documents downloaded, that is why maybe some 3% of the participants considered a CoP as not effective for transferring knowledge.

#### 4.12.2 Succession Planning

Succession plans were considered 21% effective by the participants. When employees retire, organisations face the loss of intellectual and institutional experience memory and capital for problem solving. One way of overcoming this challenge is to introduce succession plans. 12% reflected that succession plans are very effective while the other 37% were of no opinion that succession plans effective. 4% of the participants considered succession plans as somewhat effective whilst the other 26% considered succession plans not effective at all. The responses from the participants are shown in **Figure 4.31** below:



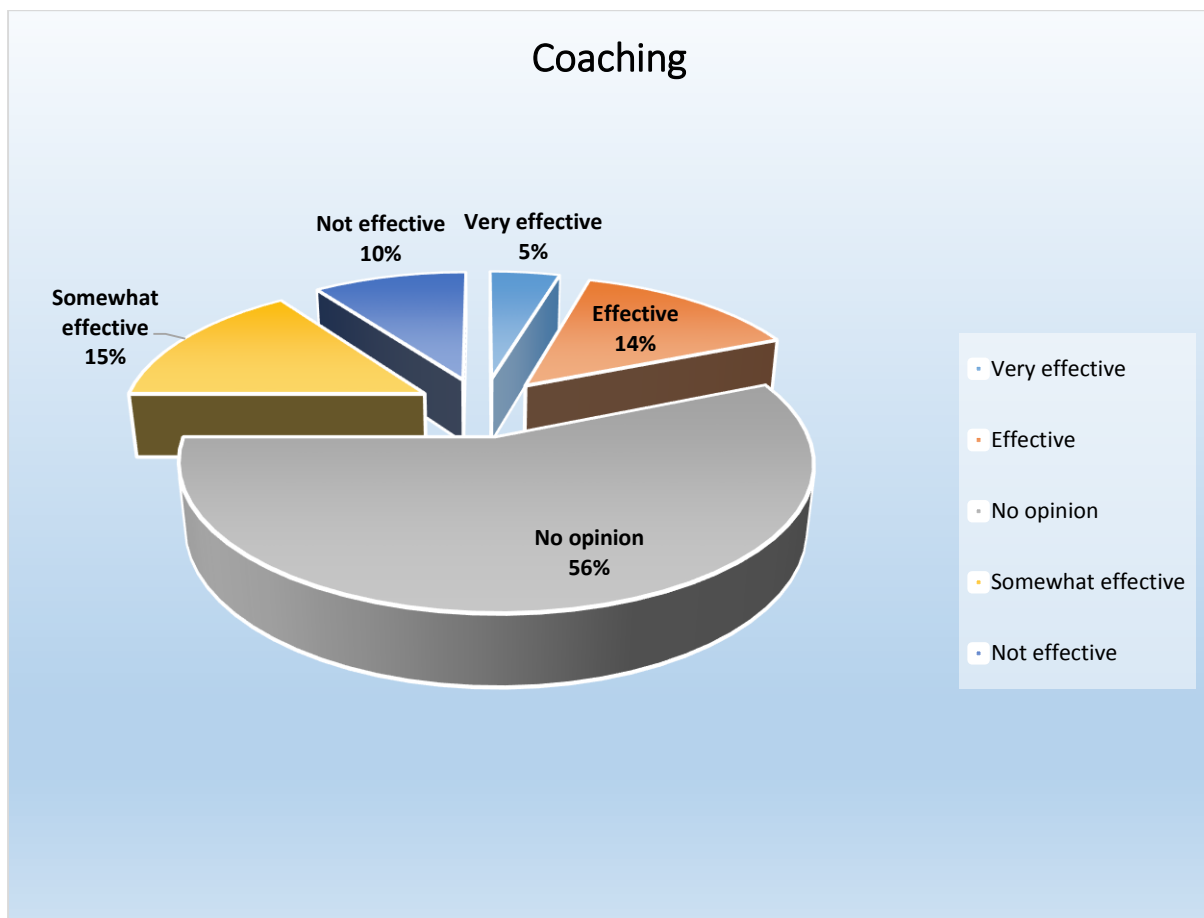
**Figure 4.31 Succession plans for knowledge transfer**

According to the Management Mentors (2015), one of the most important issues for building innovation capacity is the acquisition and maintenance of knowledge. This can be achieved by introducing succession plans, thus capturing, organising and transferring organisational knowledge is crucial for organisational success. Knowledge is the foundation of human capital, and the ability to attract and retain knowledge is an important component of innovation. By attracting and retaining good staff, the organisation is retaining organisational knowledge (APO, 2010). Succession plans in this case were therefore found to be very important at the institutions investigated.



### 4.12.3 Coaching

Coaching refers to an interactive process through which managers aim to solve performance problems (Graduate Mentorship Guidebook, 2015). From the empirical evidence gathered from the participants, it was found that coaching is very effective and effective by 14% and 5% of the respondents respectively. The key goal of coaching is to correct inappropriate behaviour, improve performance and impart skills. A small percentage of 10% considered coaching as not effective and 15% considered coaching as somewhat effective. A median percentage of (56) perceived coaching with no opinion. The responses from the participants are presented in **Figure 4.32** below:

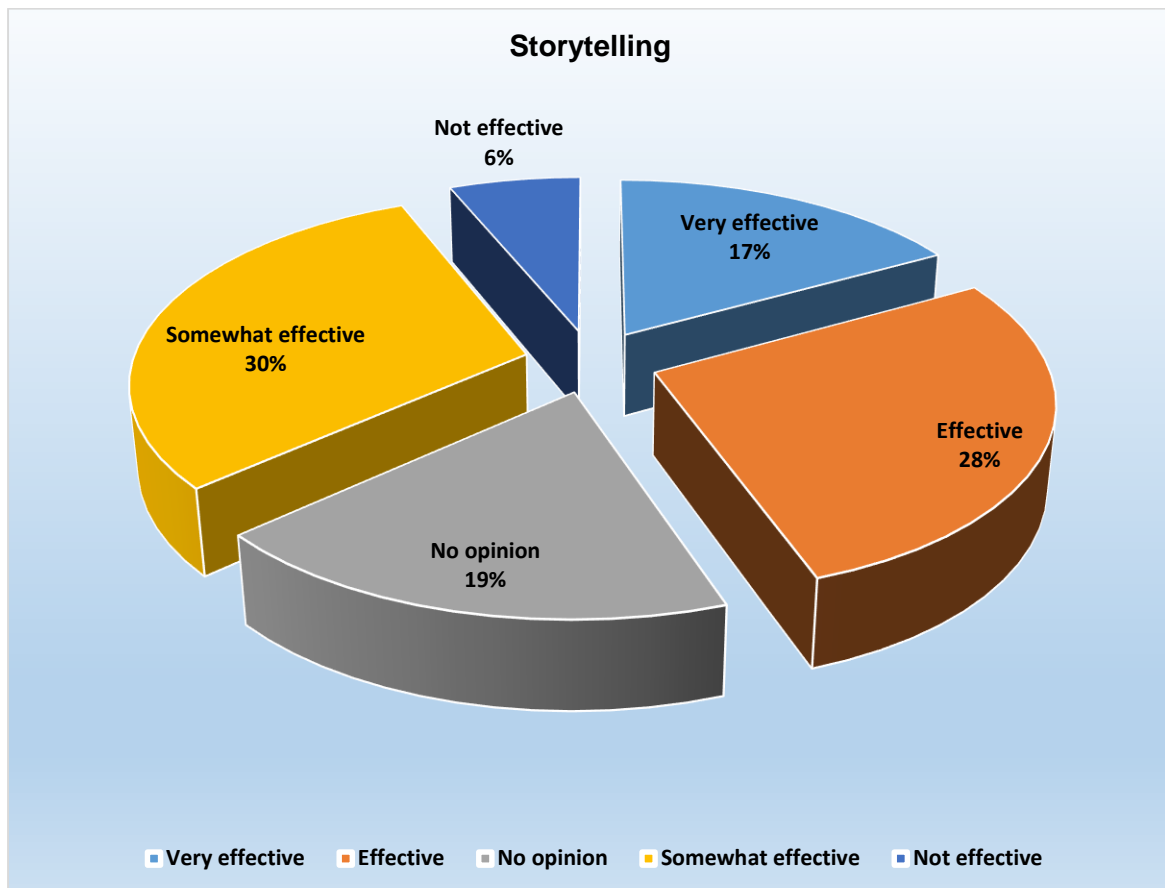


**Figure 4.32. Coaching for knowledge transfer**

According to the Management Mentors (2015), coaching is task oriented and is short term which is performance driven. The focus of coaching is on immediate problems and opportunities. Coaching increases productivity by fostering a positive work culture. In addition, coaching helps employees feel comfortable with management and encourages open communication. This ultimately results in a positive work experience.

#### 4.12.4 Storytelling

Storytelling is used to transfer experts' knowledge to the younger generation of employees (Whyte & Classen, 2012). Moreover, storytelling is used to share lessons learnt from projects with co-workers and other peers. In this study, 17% and 28% of the participants considered storytelling as very effective and effective respectively. 30% of the participants considered storytelling as somewhat effective. 6% of the participants did not see storytelling as effective thus, they considered it not effective at all. The actual percentages of the responses from the participants are shown in **Figure 4.33** below:

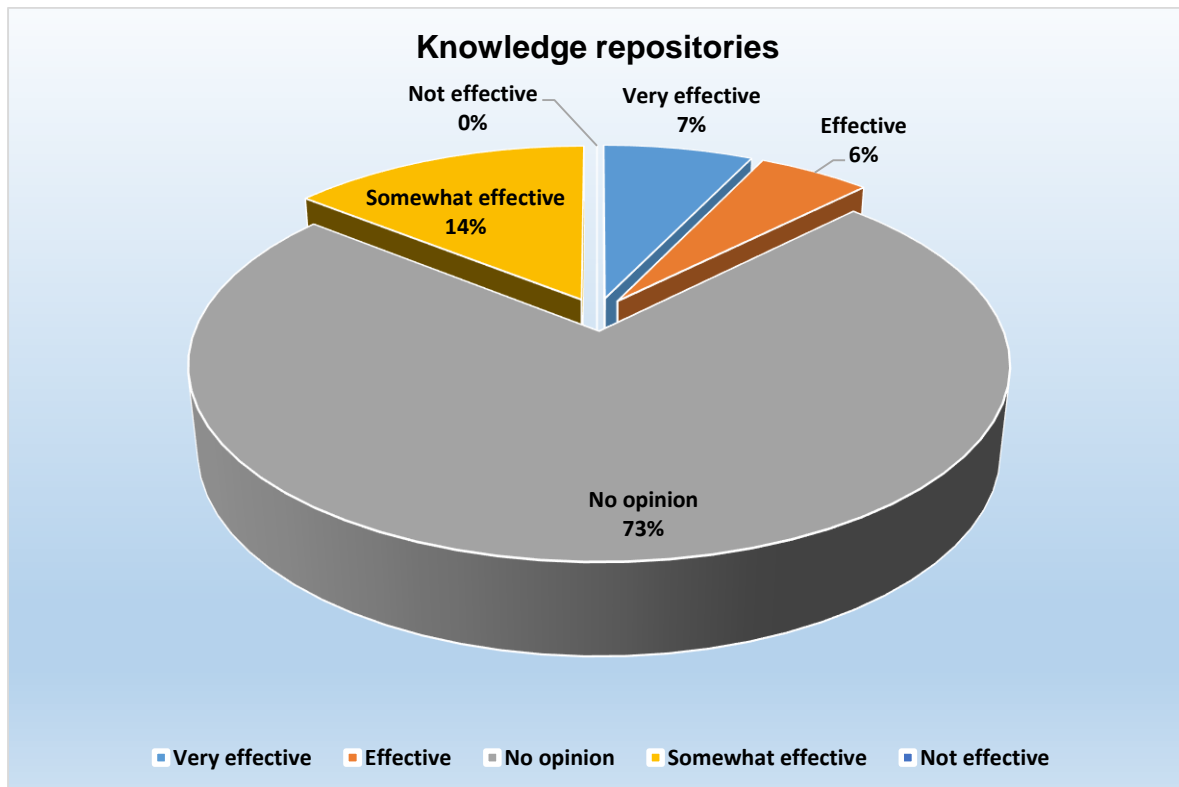


**Figure 4.33 Storytelling as a knowledge transfer tool**

According to Whyte & Classen (2012), storytelling is a vital tool for transferring tacit knowledge and it has been found to allow for sharing of deeper knowledge than the Information Technology tools which are readily available today. Arguably, storytelling is the best way to transfer tacit knowledge, in the sense that the storyteller is able to transfer information in a way people understand easily. That may be possible because a huge percentage of 28% considered storytelling as effective. Only 6% considered storytelling as not effective at all, may be because it is time consuming to tell stories compared to the practical use of IT-tools.

#### 4.12.5 Knowledge repositories

Knowledge repositories, as defined by Liebowitz (2012), are on-line storehouses of expertise and documentation about a specific domain and discipline. Very few of the participants at the organisations studied have used knowledge repositories and because of such, they considered knowledge repositories with no opinion by a corresponding 73%. Out of the total participants, 14% considered knowledge repositories as somewhat effective. Only 6% considered knowledge repositories as effective. The individual responses about the effectiveness of knowledge repositories from the participants are shown in **Figure 4.34** below.

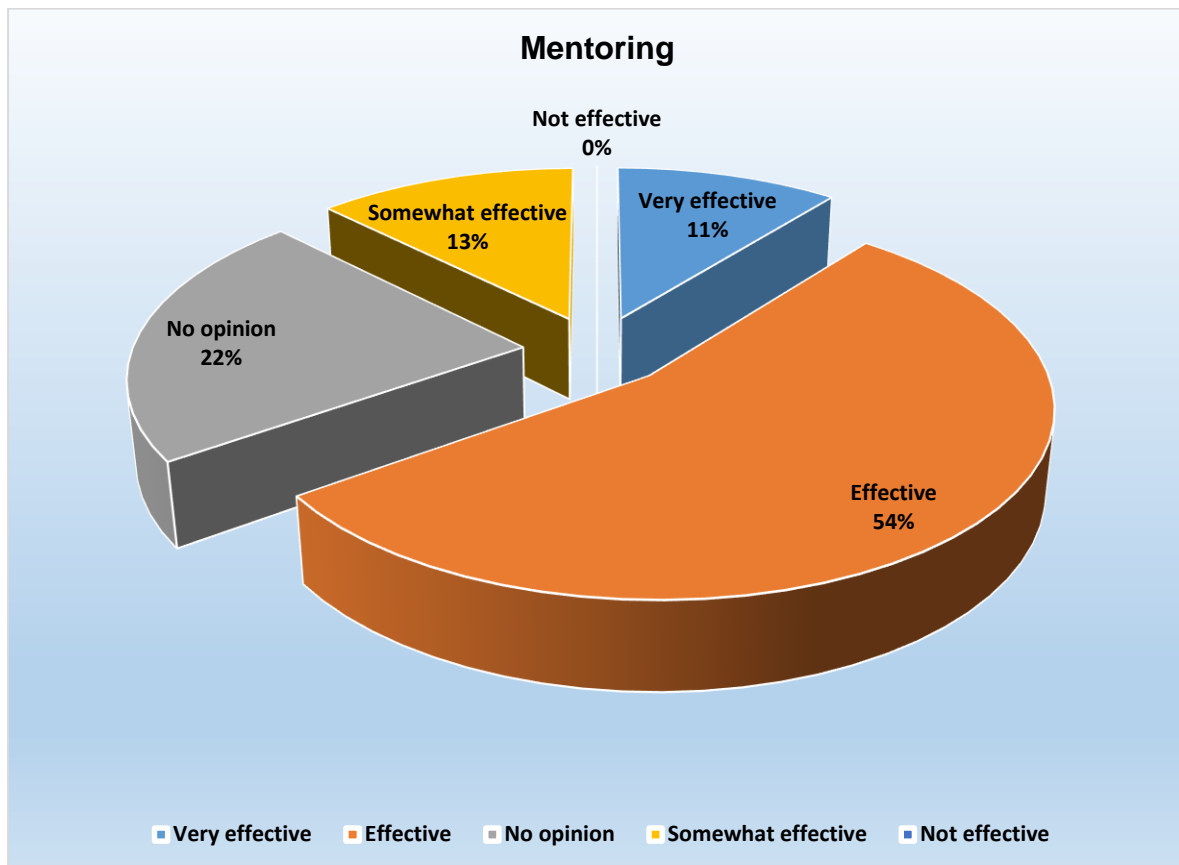


**Figure 4.34 Knowledge repositories for knowledge transfer**

In a nutshell, knowledge repositories are private databases that manage enterprise information. From an organisational perspective, knowledge repositories make it easy to find relevant information and resources enabling better and faster decision-making. Knowledge repositories help organisations connect people with expertise via discussion forums and online searchable libraries. Some sources, like the Data Mining Techniques (2011), refer to knowledge repositories as data warehouses. Most importantly, knowledge repositories reduce training time for new staff and they also help uncover automation opportunities via online self-help.

#### 4.12.6 Mentoring

Mentoring was found to be effective especially at the specific organisations studied. In the same study, 54% of the participants considered mentoring as effective because skills have to be transferred from more experienced workers to less experienced workers through mentorship. There was no participant who considered mentoring as not effective. 22% ranked mentoring with no opinion and only 11% of the participants considered mentorship as very effective. The other 13% considered mentoring as somewhat effective. Actual responses from participants are shown in **Figure 4.35** below:

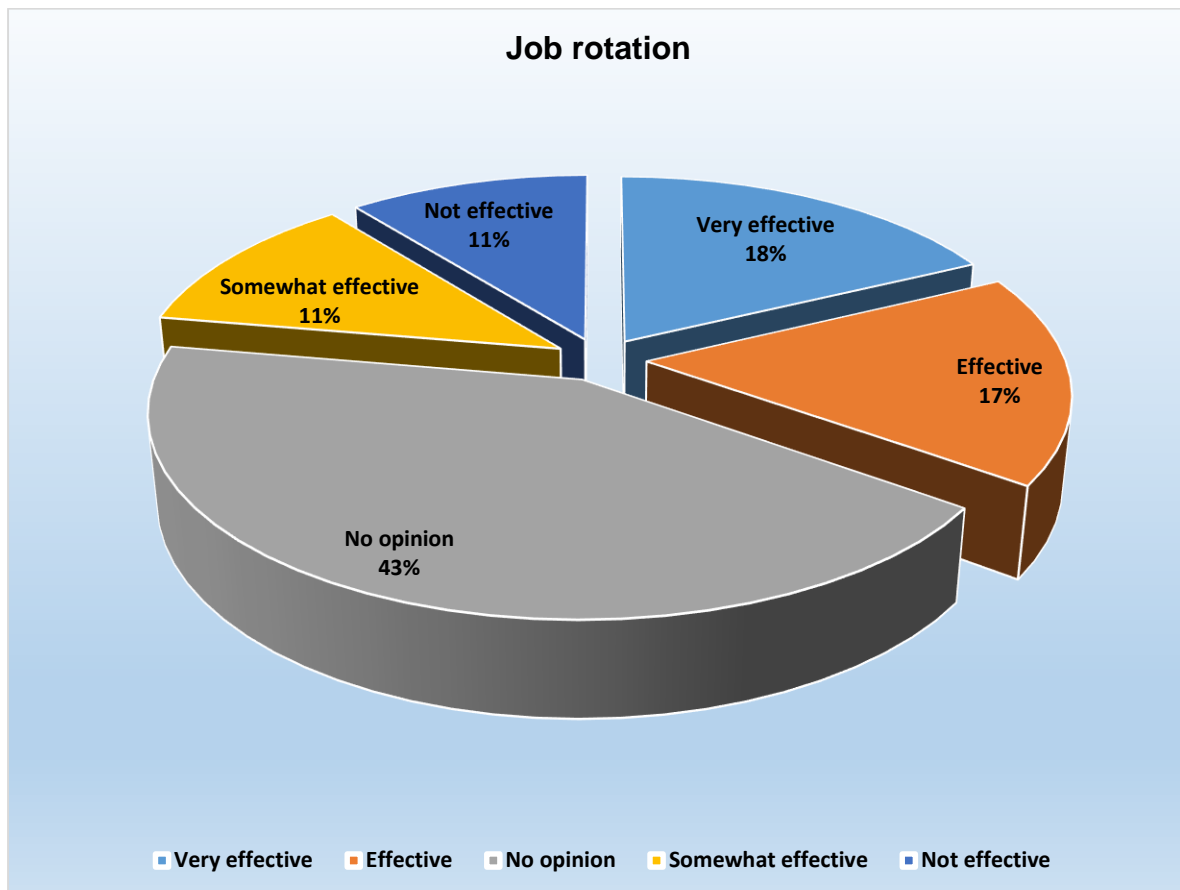


**Figure 4.35 Mentoring for knowledge transfer**

Mentoring provides professional socialisation and personal support to facilitate knowledge transfer in organisations. Mentoring is relationship-oriented construct which is long-term and development-driven (Management Mentors, 2015). Mentoring in organisations is needed to maximise knowledge transfer and increase skill levels, thus 54% of the participants identified it as effective in KM.

#### 4.12.7 Job rotation

According to the literature review segment of this research, job rotation is one of the oldest knowledge transfer activities (Lu & Yang, 2015). The information gathered from the participants revealed that job rotation is still very useful, especially if the organisation is to remain competitive. Participants considered job rotation with mixed views. 18% considered it very effective, 17% considered it effective, 43% were of no opinion, while 11% considered it somewhat effective. The other 11% considered job rotation as not effective. **Figure 4.36** below graphically presents the findings on job rotation.

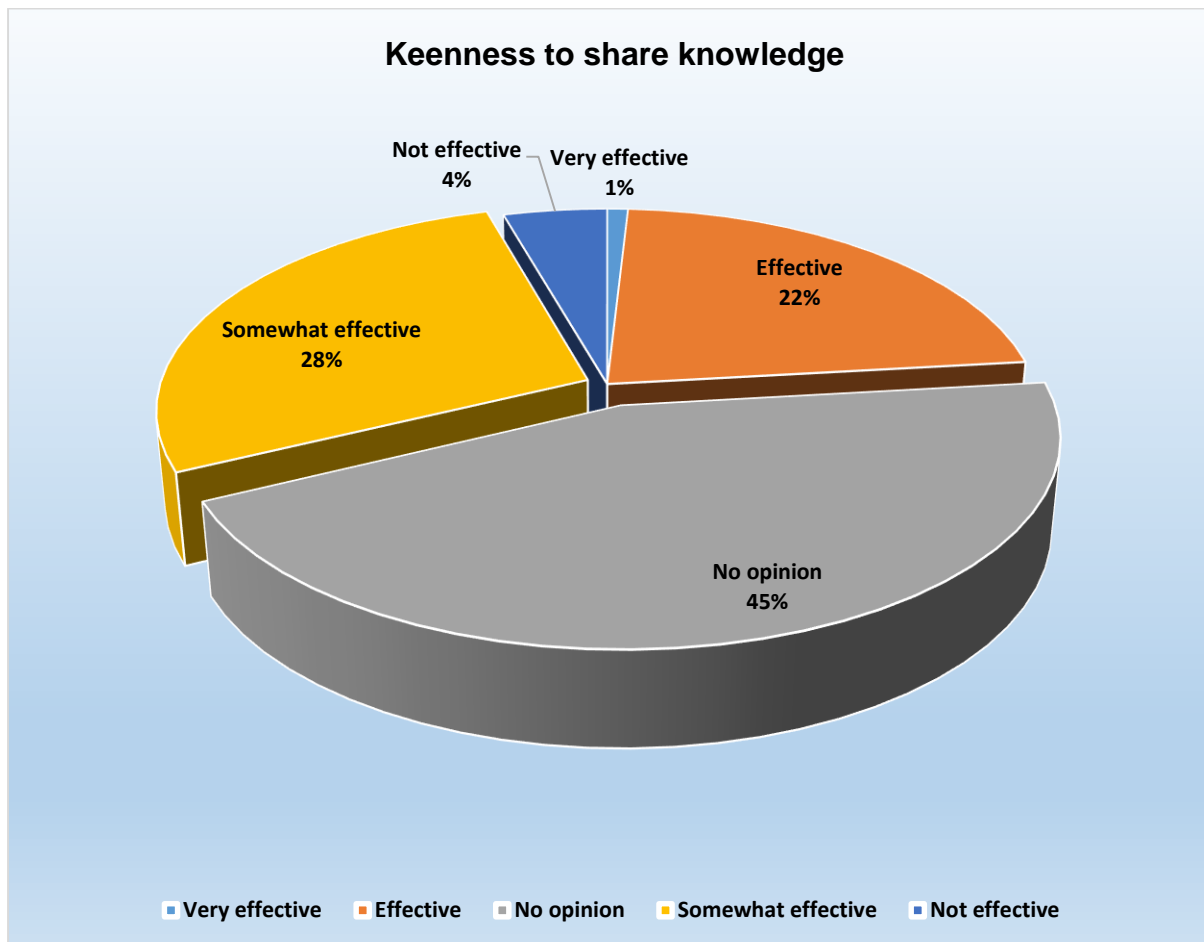


**Figure 4.36 Job rotation for knowledge transfer**

Job rotation is necessary especially for people with similar levels of education in the same discipline. This rotation allows them to share information and knowledge, thus promoting KM. Job rotation in a dynamic organisation might increase job satisfaction as workers are exposed to various tasks which might reduce physical and mental stress. Job rotation creates employees with a broad base of organisational knowledge who can be leaders (Leslie, 2012).

#### 4.12.8 Keeness to share knowledge

Most of the research participants had the zeal to share knowledge with their co-workers. 22% of the participants considered keenness to share knowledge as effective, 45% had no opinion. 28% were of the opinion that keenness to share knowledge is somewhat effective. 4% considered it not effective and only 1% of the participants considered it very effective. **Figure 4.37** graphically presents the findings from the participants on keenness to share knowledge.

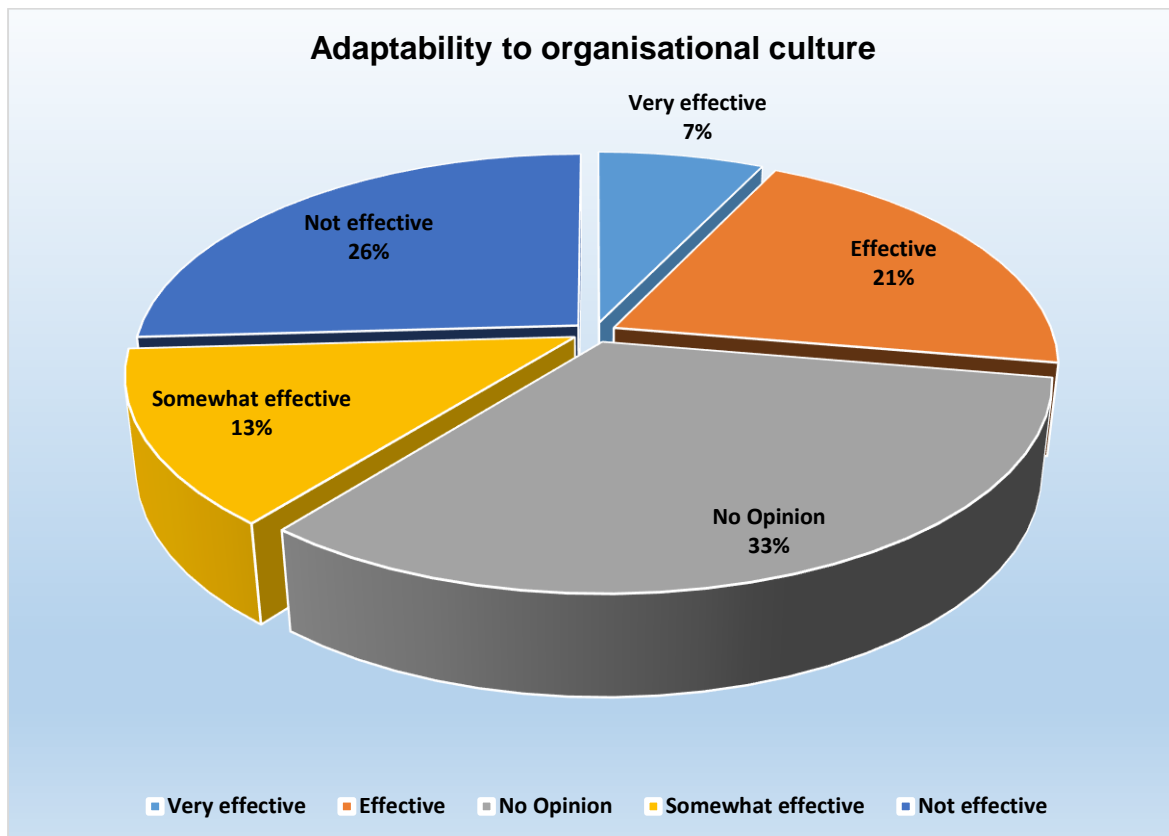


**Figure 4.37 Keeness to share knowledge**

Knowledge sharing is one of the prime objectives of KM which ensures that the knowledge is available as and when required to make informed decisions in organisations. A significant percentage of 22% is a good indicator that the participants were willing to share information and knowledge in their organisations. The quality of motivation is therefore vital for experts to share or withhold knowledge.

#### 4.12.9 Adaptability to organisational culture

In KM, organisational culture is regarded as an enabler or facilitator (Song, 2007). Organisational culture defines the norms and beliefs that direct the performance of an organisation's staff (Hassan & Al-Hakim, 2012). Adaptability to organisational culture was found to be a very effective knowledge transfer activity. Responses from participants indicated 7% very effective, 21% effective, 33% no opinion, 13% somewhat effective and 26% not effective. **Figure 4.38** graphically presents the findings from the participants on adapting to organisational culture.



**Figure 4.38 Adaptability to organisational culture**

Designing KM initiatives around organisational culture, the organisation initiates a cultural change. Organisational culture should be considered when measuring the usefulness of knowledge transfer activities. Organisational culture, according to Anderson (2009), is a combination of shared histories, anticipations and social duties that compel productive behaviours in an organisation. Having 21% of the participants considering adaptability to organisational culture as effective clarifies the significant observation that if an organisation has a culture of sharing, implementing knowledge sharing becomes easier.

#### **4.13 Summary**

The chapter analysed and presented data gathered from the organisations identified at the onset. Qualitative data was analysed and presented statistically in the form of frequencies and percentages. The qualitative data was analysed using content analysis and presented by narrative statements. In addressing the first objective which sought to synthesise the literature and come up with the meaning of KM in organisations, 18 statements were analysed quantitatively to reveal the meaning of KM. The analysis focused on the different aspects of KM as well as the challenges of ICTs for KM as it was one of the major objectives. The relationship between IT and KM was analysed quantitatively using Pearson's product moment coefficient correlation. Determining the connection between IT and KM was again another prime objective of this study and it was found that there is a positive relationship of 0.6 between IT and KM.

The other data analysis concentrated on the initiatives that enable knowledge sharing. This was addressing the study objective which sought to explore the initiatives that facilitate knowledge sharing. The barriers to effective KM were also analysed quantitatively using frequencies and qualitatively using the content analysis technique to address the sixth objective which sought to identify and describe the KM barriers. In determining the role of social media for KM, the data analysis revealed that 63.4% of the participants confirmed that social media promotes a knowledge sharing culture. In addition to that, more than 50% of the participants considered motivation as a very important factor for experts to share knowledge. CoPs were considered as the best knowledge transfer activities in the organisations studied. The next chapter provides a discussion of these findings.



## CHAPTER FIVE - DISCUSSION OF FINDINGS

### 5.1 Introduction

This chapter starts by restating the objectives of the study. The objectives of the study sought to synthesise the literature and coming up with the meaning of KM. The other objectives explore the initiatives available that facilitate knowledge transfer and knowledge sharing in knowledge-intensive organisations. Moreover, the study aimed at identifying and describing the barriers to effective KM and the derivation and development of solutions to overcome these barriers. More so, the study sought to match the KM tools and technologies with organisational culture and structures in place. The other key objective was to measure the effectiveness of the knowledge transfer activities in organisations so as to promote a knowledge sharing culture.

This chapter therefore discusses the findings of the data collected, analysed and presented in chapter four (4) in an endeavour to answer the following main research question:

*How can Knowledge Management through knowledge sharing and knowledge transfer, contribute to more effective organisational transformation in Namibian knowledge-intensive organisations?*

#### Sub-questions

- a) What does Knowledge Management mean in knowledge-intensive organisations?
- b) What mechanisms can be introduced to enable and facilitate knowledge sharing in knowledge-intensive organisations?
- c) What are the barriers that impact on Knowledge Management (knowledge sharing and knowledge transfer)?
- d) How can people be motivated to improve knowledge sharing and transfer?
- e) How can Knowledge Management tools and technologies (particularly social media tools and technologies) support knowledge sharing and transfer?

A thematic approach was used in the discussion of findings. The researcher extrapolated patterns and made sense out of the data analysed. The researcher further provided an argument based on the findings, with specific reference to the research questions defined. These detailed discussions show how each of the objectives have been met. The chapter also describes the limitations and gaps in the study.

## **5.2 Meaning of Knowledge Management in knowledge-intensive organisations**

Several definitions of KM exist in literature. Many researchers like Koenig (2012), Stuhlmann (2012), Girard & Girard (2015), Dalkir (2011), Frost (2014) and Lastres (2011) discuss KM as a collection of practices associated with the use of knowledge to create value in organisations. In this study, 18 constructs developed from the literature review were analysed in an effort to come up with an acceptable definition of KM in a given organisational context. The data analysed revealed that KM means facilitating fast and better decision making as characterised by 71% of the participants who strongly agreed and agreed with the decision-making construct. We can further generalise that KM is a practice which creates competitive advantage for organisations where 87% of the participants strongly agreed and agreed with the dimension.

In addition, we can further deduce that KM helps in continuous transformation of individual learning to organisational learning as indicated by the participants with 84% representation on strongly agreeing and agreeing with the construct. Since 71% of the participants strongly agreed and agreed that KM minimises loss of corporate memory, we can realise that minimising loss of corporate memory is a fundamental aspect of KM. We can finally conclude that KM is a practice which requires executive support as 87% of the participants strongly agreed and agreed with the construct. These findings certainly meant that the dimensions of KM are linked to better decision-making. The findings derived here are consistent with the initially adopted definition by Stuhlmann (2012) which states that KM is a conscious strategy implemented to gather, store and retrieve knowledge and then help distribute that knowledge to those who need it in a timely manner.

Knowledge Management is partly supported by Information Technologies. Digital technologies like cellphones, tablets, laptops, e-mail, wikis, knowledge bases, blogs and discussion forums are used to promote KM in organisations. In this study, participants were found to be competent and experts in the use of cellphones, e-mail, laptops and tablets. E-mail was found to be the most widely used technology for knowledge transfer at the organisations studied. Even though most ICTs used today were not designed for KM as Song (2007) says, competence in the use of those technologies is bound to certainly benefit organisations. According to the Global Information Technology Report (2016), competence in digital technologies usage accelerates innovation in the digital economy.

### **5.3 Mechanisms to enable and facilitate knowledge sharing**

Several mechanisms can enable and facilitate knowledge sharing in knowledge-intensive organisations. In response to the research sub-question: *What mechanisms can be introduced to enable and facilitate knowledge sharing?* This study has identified initiatives and motivational factors that can contribute to effective Knowledge Management and eventually lead to increased organisational performance. Incorporating the identified initiatives into the organisational culture and structures will certainly benefit these organisations.

#### **5.3.1 Initiatives to enable knowledge sharing in organisations**

Wang & Noe (2010) proposed that the realisation of KM initiatives rests on knowledge sharing. Literature review has proved that executive support is very important for all KM initiatives to succeed. According to this survey, 26.7% of the participants agreed that their organisations' management supports KM initiatives. On the knowledge sharing dimension, 13.3% and 65.1% of the participants strongly agreed and agreed that their institutions support and promote a knowledge sharing culture. This finding is quite consistent with prior studies by Frost (2014), which proved that people implement organisational changes to enable a knowledge sharing culture. Therefore, management support and promotion of a knowledge sharing culture are essential initiatives for knowledge sharing.

53.5% of the participants indicated that their organisations have the necessary technology to support KM. This finding has also been established by Song (2007) who says an organisation cannot support its staff to share knowledge if it does not have a strong IT infrastructure. With all the available infrastructure, the institutions studied did not offer KM workshops and courses. 45.5% of the participants disagreed that their institutions offer KM courses and workshops. It is well known that organisations require a separate budget for KM efforts as evident in the searches undertaken but 36.6% of the participants indicated that their institutions do not fund KM courses. Consequently, the organisations studied should offer and fund KM courses and also allow time to attend KM workshops in a bid to improve organisational performance.

Most of the responses to knowledge sharing initiatives were median, meaning that the initiatives should be taken seriously so that the organisations reach their long term goals and objectives of boosting productivity and accelerating innovation. Other initiatives like development of succession plans, coaching and mentoring were also considered important for improving organisational efficiency. Supplementary information from the interviews with HODs and managers showed that knowledge sharing should be integrated into everyone's job profile and it was also mentioned that technology should work for the people not the other way round.

### **5.3.2 Motivational factors for experts to share knowledge**

Motivation is very important for experts to share knowledge and this idea is supported by Stenius et al (2016) who states that motivation is important for all knowledge-based work. In the literature review it was found that experts in different fields should be motivated in some way to share what they know. This motivation could be in form of rewards, recognition, promotion, bonus and or pay for performance. Results of this study have shown rewards recording the highest percentage (51.8%) of participants who consider it an important motivational factor and this is in confirmation of submissions according to the APQC (2010) that KM requires unique forms of rewards.

It has been established that 12.5% of the participants considered recognition as the most important motivational factor. This recognition may be at the individual, departmental or organisational level. Though promotion is one of the oldest forms of motivation, 24.1% of the participants still valued it. Bonuses and pay for performance recorded less than 10% each which means that those forms of motivation were marginally important. We can therefore confirm that organisational aims can only be realised if organisations integrate motivation for its workers with the daily chores that define specific duty profiles (Singh & Kant, 2008) since it has already been highlighted that workers can only share their knowledge when they are motivated.

Participants further highlighted other motivational factors they expect like advancement and personal growth. This definitely meant the motivational factors outlined in this study are not the end all. The findings in this study are similar to the findings by Stenius et al (2016) where it was revealed that the quality of motivation is important in knowledge intensive work which is cognitively demanding. A knowledge intensive job requires workers to be well educated and experienced in order to work effectively and ultimately improve the organisational performance.

### **5.4 Barriers to Effective Knowledge Management**

Barriers have been defined as elements that negatively affect the realisation of KM in organisations (Ujwary-Gil, 2011). Riedge (2007) classified knowledge sharing barriers into three (3) categories: organisational barriers, technological barriers and individual barriers. Current and contemporary studies, including this one, attempted to find ways to overcome these barriers and improve organisational performance. In response to the research sub-question: *What are the barriers that impact on Knowledge Management?*, this study has identified twelve barriers that impact effective Knowledge Management as explained below.

#### **5.4.1 Lack of executive support**

Executive support is necessary to create a favourable environment that inspires and supports knowledge sharing. More so, executive support is needed to block the barriers that might exist in organisations. In this study, lack of executive support was a big KM barrier with 57.1% of the participants as shown in Table 4.13 on page 113. This certainly means that the management should support KM efforts in their organisations. Evans & Dalkir (2014) are of the opinion that companies appoint KMOs specifically in charge of formulating knowledge policies. Once this barrier is removed, all the other negative hurdles would be easy to remove because the support starts from the top management. Kok (2007) argues that KM implementation is blocked by top management's resistance to change, particularly with regard to people, processes and the associated technology. Thus, there is need for an effective change management strategy to transform the organisations, a fact that consolidates the views of the participants who confirmed and also outlined that the lack of executive support can be overcome by engaging executives in the KM meetings.

#### **5.4.2 Lack of budget**

According to this study, the greatest barrier to effective KM was the "lack of budget" to support KM undertakings. Goodluck (2011: 3), states that successful KM requires sufficient budget and sound financial management. In this investigation, 67.9% of the participants were of the opinion that a separate budget is necessary to realise the KM goals. Lack of budget is closely aligned to executive support because all the budgets are created and implemented by the organisation's management. This might mean that these two barriers are closely connected from an organisational perspective. Taking into consideration that implementing any project requires some money, it is therefore essential for the organisations studied to allocate separate and sufficient funds for KM projects. Allocation of sufficient funds to support KM efforts is the only remedy to this barrier, a point which was raised by Oliva (2014).

#### **5.4.3 Resistance to change**

Resistance to change is defined by Hiatt & Creasey (2012) as actions taken by individuals when they perceive that a change that is occurring as a threat to them. In this study, 38.3% of the participants considered resistance to change as a barrier to effective KM. In this 21<sup>st</sup> century, organisations are changing the way they operate and the way they integrate with new technologies, but some people still resist change as evident in the data gathered, analysed and presented in Table 4.13 on page 113. The percentage shows that most of the participants cannot easily adapt to the new ways of doing things and they see the risk of change as greater than the risk of not changing.

From the searches undertaken, people resist change in organisations because of fear of the unknown, lack of competence, lack of trust, poor communication and the fact that they are connected to the old way. We can therefore deduce that change itself is not a problem but resistance to change is the problem which needs to be addressed through a proper change management plan which is aligned to the organisational objectives. Some participants noted that resistance to change could be overcome by education and proper communication.

#### **5.4.4 Prohibitive organisational structure**

A small percentage of 10.7% of the participants indicated that prohibitive organisational structures prohibit them from reaching the desired KM goals of knowledge sharing. This finding might mean their superiors' turn down their individual efforts to share knowledge. All organisations studied here had a line organisational structure which tends to simplify and clarify authority, accountability and responsibility. Restructuring and flattening the organisational structure might improve knowledge sharing. According to Wenger (2010), flattening organisational structures eliminates organisational layers and knowledge sharing is highly likely to take place when people are in decentralised organisations.

#### **5.4.5 Lack of time, motivation and rewards**

Time is very important in KM because it is a scarce resource. Time and time management are essential factors in almost all organisations. In this survey, 52.7% of the research participants considered lack of time, motivation and rewards as a great barrier for KM as shown in Table 4.13 on page 113. This indicates that most managers in organisations do not have enough time to implement and manage KM projects. Also, employees can only have time for KM if they are motivated to do so and are backed by management, as revealed in literature. We can therefore recommend sufficient time for Knowledge Management activities and aligning these efforts with some form of rewards in a bid to improve organisational performance.

#### **5.4.6 Inefficient communication and lack of training**

Effective communication is a vital tool for organisational survival (Garcia, 2012). Communication is effective when the receiver of a message understands its meaning. Ineffective communication occurs when the meaning is not well understood. All forms of communication are equally essential in this sense. In this survey, 26.7% of the participants outlined that inefficient communication in an organisation is a barrier to effective KM as shown on Figure 4.14 on page 114. Lack of training in this case starts from understanding the meaning of KM and its associated benefits in organisations. An organisation is likely to be less effective if there is no proper communication, thus the communication gap need to be closed. Training on effective communication may be deemed necessary to eliminate this impediment.

#### **5.4.7 Lack of knowledge sharing culture**

CKOs are responsible for developing a knowledge sharing culture. In this survey, exactly 33% of the participants considered lack of a knowledge sharing culture as a barrier to effective KM as shown on Figure 4.14 on page 114. Knowledge sharing is at the heart of KM because knowledge must be shared and transmitted to the right person at the right time. An appropriate organisational culture is a key aspect of successful KM implementation (Blanco et al, 2012). Values and beliefs of the organisation's staff makes up an organisational culture committed to knowledge sharing. Therefore, the lack of knowledge sharing culture barrier could be removed if the organisations encourage their staff to share knowledge as proposed by Srinivas & AlRashdi (2016) in their recent study on knowledge sharing initiatives for enhanced communication and collaboration.

#### **5.4.8 Lack of technological infrastructure**

From the classification of knowledge sharing barriers by Riedge (2007), lack of technological infrastructure falls under the technological barriers. In this survey, only 8.9% of the participants considered lack of technological infrastructure as a barrier to KM effectiveness as shown on Table 4.13 on page 113. This small percentage could be due to the fact that all the organisations studied have got all the tools and technologies necessary to support KM. So this barrier does not really affect the implementation of KM efforts at these institutions. In addition to that, technology partially support KM efforts by providing an enabling environment to share knowledge. These findings are also consistent with the early findings from Song (2007), who argues that Information Technologies are just enablers for effective KM.

#### **5.4.9. Lack of trust**

Trust is always interconnected to knowledge sharing. In this survey, 31.2% of the participants as shown on Figure 4.14 on page 114 considered lack of trust as a barrier to effective KM. A low level of trust among employees reduces the effectiveness of an organisation. This idea of trust in KM is seconded by Rutten, Blaas-Franken & Martin (2016: 208) who noted that a lower level of trust within CoP results in less knowledge sharing. Knowledge has been perceived as the most critical resource an organisation should embrace and is a valuable organisational survival tool. Therefore lack of trust among workers may hamper the effectiveness of an organisation. Trust in a team is built by communicating openly and leading by example and that is the only way to remove this KM barrier.

#### **5.4.10 Differences in levels of education**

Differences in the level of education recorded the least percentage of all the KM barriers in this study with only 5.3% of the participants as shown on Figure 4.14 on page 114. This finding could be because all the participants to this study had almost the same level of education and were working at similar institutions. Different levels of education was not really seen as a barrier which can negatively affect KM endeavours at the organisations studied.

#### **5.4.11 Lack of clear return on investment**

From a business perspective, every investment should at some point yield quantifiable results. KM is an organisational investment but its return on investment is difficult to quantify. According to the data collected, analysed and presented on Figure 4.14 on page 114, only 15.1% of the participants considered lack of clear return on investment as a barrier to effective KM in organisations. It is to some extent difficult to quantify the returns on investments for knowledge, thus the participants looked at it as a barrier to effective Knowledge Management.

#### **5.4.12. Lack of appropriate methodologies**

Lack of appropriate methodologies has been found to be another great barrier to effective KM. Out of the 112 participants, 37.5% of them considered lack of appropriate methodologies as an obstacle as shown on Figure 4.14 on page 114. This has also been evident in the literature where it was revealed that there is no universal methodology for implementing KM in organisations (Dalkir, 2011; Steiner, 2010; Schroeder, 2012). Different methodologies are used for different organisations depending on the organisational long term goals and objectives. Thus we can conclude and advise that each organisation should implement KM in its own context using a viable methodology that is alert to the rest of the factors discussed already.

In this survey, it has been clearly revealed that lack of budget to support KM efforts is the greatest barrier to effective KM as evident in the data collected and presented with a 67.9% representation on Figure 4.14 on page 114. Lack of executive support was second with 57.1% of the participants. Lack of time, motivation and rewards recorded 52.7% and all the other barriers recorded less than 50% of the participants. From this observation we can conclude that lack of budget is the biggest barrier to effective KM. Overcoming barriers can be done by availing sufficient funds for KM and having management support. This may certainly improve organisational performance and ultimately transform those organisations into desired states with the support of ICT tools.



## **5.5 Tools and technologies to support KM**

In an effort to answer the last research sub-question which sought to find how the available KM tools and technologies support knowledge sharing, several tools were analysed and discussed. These tools were either IT-based or non-IT based and are discussed here starting with the IT tools namely: knowledge bases, Blogs, social networks and document libraries. The role of social media is also discussed together with the connection between IT and KM. The sub-question was: *How can KM tools and technologies support knowledge sharing?*

### **5.5.1 Knowledge bases**

According to the APQC (2010), knowledge bases assists people to create, collaborate, develop and access knowledge. In meeting user expectations of sharing knowledge, 40% of the participants outlined that knowledge bases meet their needs. This is a significant percentage since knowledge bases give a complete context of a topic. 22% of the participants outlined the need for improvements on this tool as shown on Table 4.20 on page 141. This might mean that these participants needed training on how to use knowledge bases. This is also supported by the finding on the availability of knowledge repositories at their institutions. So these organisations may appoint knowledge base managers to better manage the knowledge bases.

### **5.5.2 Blogs**

According to the APQC (2010), writing blogs is a way of engaging in knowledge capture and sharing. Apart from the fact that blogs are widely used for knowledge sharing, only 11% of the participants highlighted that blogs meet their expectations. Also, 19% of the participants mentioned the need for improvements. On the same aspect, 70% of the participants considered blogs with no opinions. Literature reviewed has shown that the contents of a blog can build up to become a very useful knowledge base. Thus, we can conclude that additional features should be added to blogs so that they meet user needs as reflected here.

### **5.5.3 Social networks**

It is well known that social networks consists of groups of people who share a common area of concern. According to this study, social networks meet user expectations by 38% and exceeds user expectations by 3%. These percentages closely resemble how important social networks are in KM. This might mean that the social networks are user-friendly and are accessible from almost everywhere on any device at minimum or no cost at all. Making use of social networks has become part of our daily activities, thus the participants value these technologies for KM. Using social networks to support knowledge sharing is important for boosting organisational efficiency (Wang & Noe, 2010). We can therefore generalise that social networks are powerful knowledge-sharing tools especially in competitive organisations.

#### **5.5.4 Document libraries**

Document libraries are an essential tool for supporting Knowledge Management (APQC, 2010). In this survey, 11% of the participants confirmed that document libraries meet their expectations for knowledge sharing. There were no participants who considered a document library as exceeding expectations. This might mean that document libraries meet the user expectations with no additional features. On the same platform, only 4% of the participants considered document libraries as below expectations. Well-organised and effective access to documents is the remedy to “information overload”. We can therefore conclude that document libraries are very essential in organisations which are to remain competitive.

#### **5.5.5 Collaborative virtual workspaces**

The study revealed that 80% of the participants found collaborative virtual workspaces meeting their expectations of knowledge sharing. This could be due to the fact that collaborative virtual workspaces enable people to work together, regardless of where they are physically located. This definitely means the best skills could be accessed from anywhere in the world within a very short space time. The other reason why virtual workspaces met user-expectations by such a high percentage could be the fact that users to some extent enjoy sharing information and knowledge with users scattered all over the world. Virtual workspaces are becoming an important part of many organisations’ work practices and this trend may to continue (IGI Global, 2016). We can therefore deduce that collaborative virtual workspaces are an important tool for KM in in this 21<sup>st</sup> century.

#### **5.5.6 Brainstorming**

In this study, 39% of the participants declared that brainstorming meets their expectations for knowledge sharing. Brainstorming is a non-IT tool used to share knowledge in the organisations studied. Brainstorming is an approach of assisting groups of people to generate new ideas (Dalkir, 2011) and is not suitable when a problem is known to have a single correct solution. Having 39% of the participants considering brainstorming to meet expectations of users mean that the participants are free to discuss and generate new ideas with their peers. Frequent brainstorming may partially improve organisational performance as new ideas may be generated after every brainstorming session. We can again deduce that brainstorming is an important tool for Knowledge Management which allows sharing and generation of new ideas and concepts.

### **5.5.7 Storytelling**

According to this study, 23% of the participants considered storytelling meeting their expectations. On the same dimension, 5% also confirmed that storytelling exceeding their expectations. Despite the fact that storytelling is an old tool, it is still found to be useful in most modern organisations (Lukosch & Buttler, 2011) as it conveys events in words, images and sounds. In the context of KM, storytelling is used to transfer specifically tacit knowledge. Though storytelling is more time-consuming for both storytellers and audiences 23% of the participants still considered it effective in meeting their knowledge sharing expectations. Therefore we can conclude that storytelling conveys much richer contexts of information than other KM tools, a finding which is similar to the findings by Whyte & Classen (2012) on their study on storytelling to elicit tacit knowledge.

### **5.5.8 Communities of Practice**

In this survey, 62% of the participants highlighted that CoP meets their expectations to share knowledge. In addition to that, 10% of the participants also added that CoPs exceeds expectations as shown on Table 4.20 on page 141. Wenger (2010) defined CoPs as groups of people who share a common concern. The participants therefore viewed CoPs as powerful tools for knowledge sharing in their organisations as evident in the data gathered, analysed and presented. COPs are largely used for sharing common skills and expertise. However, there are some COPs focus mainly on innovation and generating new knowledge. These findings therefore demonstrates that CoP are important in organisations for KM, a point that Jang & Ko (2014) emphasise.

### **5.5.9 Collaborative physical workspaces**

In this investigation, 14% of the participants underscored that collaborative physical workspaces meets their expectations for knowledge sharing. Moreover, 3% of the participants considered physical workspaces above expectations. A physical workspace in the KM context, is defined as the settings in which we actually work. Sharing of knowledge in physical workspaces is normally done through face-to-face meetings and a good workspace certainly promotes knowledge sharing (Dalkir, 2011). According to Coradi et al (2015), all the planning for KM start from a collaborative physical workspace. We can therefore deduce that physical workspace meets expectations of the participants because all the planning of KM undertakings starts from a collaborative physical workspace.

### **5.5.10 Learning reviews**

Learning reviews enable project teams and individuals to learn during the work process. In this survey, 4% considered that a learning review meets their expectations. On the same facet, 3% of the participants noted that learning reviews exceed expectations. Since the main purpose of a learning review is for team members to constantly learn, the participants did not really see learning review as a powerful tool for knowledge sharing. In most cases, projects are carried out without reflecting until completion (PMBOK, 2016). Arguably, learning reviews enables team members to learn immediately from both failures and successes.

The findings from this study might suggest that learning reviews be built into the allotted time frame so that it's not seen as an afterthought activity. According to the information from this study, the best IT tool to support KM is a collaborative virtual workspace which meets user expectations by 80%. On the other hand, the best non-IT tool to support KM is a CoP which meets user expectations by 62%. All the other tools meet the user expectations by less than 50% in the order, knowledge bases 40%, brainstorming 39%, social networks 38%, storytelling 23%, collaborative physical workspaces 14%, blogs 11%, document libraries 11% and finally learning reviews with 4%.

We can therefore conclude that both IT tools and non IT tools are important for effective KM in organisations. An organisation should select the best available and viable tool for its KM undertakings. It is also important at this juncture to discuss the effectiveness of the various knowledge transfer activities which play a great role during the organisational transformation process.

## **5.6 The effectiveness of knowledge transfer activities**

Assessing the usefulness of knowledge transfer undertakings was essential in this study so that the best activities could be selected and fixed into the organisational structures and processes. From the research objectives, KM should result in complete organisational transformation which involves redesigning and redefining business processes. Knowledge transfer activities allow sharing of knowledge in an organisation. There are numerous knowledge transfer activities but this discussion only focuses on those activities which might accelerate innovation, boost productivity and eventually change organisations.

### **5.6.1 Communities of Practice**

In this study, participants confirmed that CoPs are effective for knowledge transfer in organisations by 40%. Also, 27% of the participants considered Communities of Practice as very effective. Combining 40% and 27% gives us 67%, thus, considering a CoP as 67% effective and very effective might mean that the organisational members share a common sense of purpose. Membership penetration and growth are key items which should be analysed in a CoP to see how the community has grown (Jang & Ko, 2014). Wenger (2010) adds that CoPs are a powerful manifestation of informal learning. Participants to this study revealed that CoPs are effective which is also in line with the benefits of CoPs by Frost (2014) who explains that CoPs enable employees to manage change. Managing change clarifies the roles and responsibilities of individuals in organisations. CoPs can also foster trust and a sense of common purpose. We can therefore conclude that CoPs are important knowledge transfer activities and these findings are also consistent with Lesser & Everest (2011) who say CoPs provide access to new knowledge, generates new knowledge and encourages skills development.

### **5.6.2 Succession Planning**

Succession plans involve the identification and development of employees to fill in key positions in an organisation (Durst & Wilhelm, 2012). These plans benefit organisations by making sure that the right people are in place at the right time. Additionally, succession plans improve employees' ability to respond to changes in the workplace. In this survey, succession plans were considered 21% effective by the participants. As a matter of fact, organisations face loss of intellectual property when employees retire from their jobs (Rothwell, 2010). This problem could be addressed by introducing succession plans as knowledge transfer activities. Acquisition and maintenance of knowledge builds innovation. Succession plans in this study were therefore found to be very important and this might mean that the organisations studied have succession plans in place.

### **5.6.3 Coaching**

Coaching is a widely used knowledge transfer activity in many organisations (PMBOK, 2016). The survey results show that coaching is very effective by 14% and effective by 5%. Also, 56% of the participants were of no opinion if coaching is effective in organisations. This could have been caused by the fact that other participants considered coaching as mentoring. The participants agreed that coaching existed at their organisations and they use it to transfer skills to their peers. Coaching is therefore an important knowledge transfer tool which focuses on immediate problems and opportunities. Though other sources refer to coaching as a subset of mentoring, Al-Hakim & Hassan (2011), argue that coaching involves guiding the trainee on training in an effort to fuse operational knowledge which enhances performance.

### **5.6.4 Storytelling**

Frost (2014) defines storytelling as a powerful knowledge transfer tool that uses narratives that constitute operational knowledge. Survey results show that storytelling is an effective tool for knowledge transfer in organisations. 17% and 28% of the participants considered storytelling very effective and effective respectively. Interview results also revealed that storytelling is a good knowledge transfer tool though other participants emphasised that it takes time to tell stories and is considered inferior to IT transfer tools. These findings imply that storytelling should be promoted so that knowledge gets to the right person at the right time. These findings are consistent with those of previous research by Whyte & Classen (2012), which proved that storytelling is a vital tool for transferring tacit knowledge allowing sharing of deeper knowledge which may boost organisations. An organisation which shares knowledge among its staff will eventually be transformed, since people are the key agents of transformation.

### **5.6.5 Knowledge repositories**

The findings of this study revealed that 6% of the participants considered knowledge repositories effective for knowledge transfer. This percentage is too small and may be caused by the fact that participants were not well conversant with use of knowledge repositories. Defined by Liebowitz (2011), knowledge repositories are on-line storehouses of expertise and documentation about a particular domain. 73% of the participants considered knowledge repositories with no opinion. Knowledge repositories can be considered as online self-help as they make it easy to find relevant information and resources. We can therefore recommend training on how to use knowledge repositories to transfer knowledge in the organisations studied.

### **5.6.6 Mentoring**

Mentoring provides professional socialisation and personal support to facilitate knowledge transfer in organisations. According to the Management Mentors (2015), mentoring is relationship oriented which is long-term and development driven. In this survey, mentoring was found to be effective especially at the specific organisations studied. 54% of the participants considered mentoring as effective and this clearly means that skills have to be transferred from more experienced workers to less skilled workers. Mentoring in organisations is needed to maximise knowledge transfer and increase skill levels, thus 54% of the participants reflected it effective. In other organisations coaching and mentoring are regarded as one thing.

### **5.6.7 Job rotation**

According to Lu & Yang (2015), job rotation is one of the oldest forms of knowledge transfer in organisations. Rotating staff enables effective and efficient transfer of operational knowledge (Katselli, 2008). Based on the results from this survey, 18% of the participants considered job rotation very effective and 17% considered it effective. Of the 112 participants, 43% were of no opinion that job rotation is effective for knowledge transfer. These findings therefore signify that the job rotation knowledge transfer tool is important for transferring the relevant operational knowledge. Moreover, job rotation was considered necessary for people with less technical skills and expertise. In this case all the participants were experts in their respective areas. In reality, job rotation increases job satisfaction as workers are exposed to various activities which might reduce physical and mental stress.

### **5.6.8 Keenness to share knowledge**

Survey results presented on Table 4.20 on page 141 show that 22% of the participants considered keenness to share knowledge as effective. Only 1% of the participants considered keenness to share knowledge as very effective. Knowledge sharing is the basis of KM (AlRashidi & Srinivas, 2016) and is very important in almost all competitive organisations. Stenius et al (2016) stresses that the quality of motivation is important for experts to share or withhold knowledge. The passion to share by the participants was found to be equally important and might contribute to successful organisational performance which will eventually lead to organisational transformation.

### **5.6.9 Adaptability to organisational culture**

Organisational culture refers to a combination of shared histories, anticipations and social duties that compel productive behaviours in an organisation (Anderson, 2009). It is easy to implement knowledge sharing if an organisation has a knowledge sharing culture. In this study, 7% considered adaptability to organisational culture as very effective and 21% considered it effective. Hassan & Al-Hakim (2012) defines culture as the norms and beliefs that direct the performance of an organisation's staff. Other sources like Song (2007) express that organisational culture is just a KM enabler in organisations. Having 21% of the participants considering adaptability to organisational culture as effective mean that the participants generally share their knowledge with colleagues using different tools available.

The findings of this study reveal that mentoring is the most effective knowledge transfer activity with 54% of the participants. This was followed by CoP with 40% of the participants who ranked the CoP tool effective. Storytelling was ranked 28% effective and keenness to share had 22%. Succession plans and adaptability to organisational culture had 21% of the participants each contending that the activities are really effective. Coaching and knowledge repositories were ranked with 14% and 6% effective respectively. We can therefore conclude that the success of organisations is dependent on the effective transfer and use of knowledge. KM tools and technologies can support knowledge transfer via social media.

### **5.7 The role of social media for effective Knowledge Management**

Social media plays a great role in supporting KM activities in organisations. According to Shah & Khan (2013) social media provides platforms for knowledge sharing. These platforms allow people to contribute to a number of concerns associated with communication, knowledge sharing and collaboration. In this survey, 36.6% of the participants agreed that social media facilitates generation of new knowledge. On the same question, 12.5% of the participants strongly agreed that social media assists in the generation of new knowledge in an organisation as shown on Table 4.16 on page 132. This finding is quite consistent with Gaal et al (2015)'s findings which state that social media allows individuals to generate new possibilities and facilitate collaboration.

In addition, 69.7% of the participants agreed that junior employees will easily acquire tacit knowledge while 4.5% of the participants strongly agreed with the statement that social media allows junior employees to obtain tacit knowledge. Panahi, Watson & Partridge (2012) stress that social media enables synchronous communication in terms of chatting, discussions and storytelling. We can therefore extrapolate from this finding that social media facilitates tacit knowledge transfer to junior employees which may eventually lead to improved organisational performance.



On recognition of senior employees for their knowledge bases, 46.4% of the participants agreed, 24.1% strongly agreed and 29.5% of the participants were just neutral. Thus, we can further see that social media provides opportunities for networking and expert locating. Senior employees deserve recognition in organisations because knowledge sharing on its own is a key element of fostering value in organisations (Massaro et al, 2014). Though findings by Cesaroni & Consoli (2015) show that organisations are not yet able to fully exploit social media potentialities, 25.9% of the participants agreed that senior staff will continually upgrade their knowledge with new developments on social media.

Most importantly, 63.4% of the participants agreed that social media promotes a knowledge sharing culture which was one of the prime objectives of this study. It has been well discussed in literature that social media promotes a knowledge sharing culture (Mesquita & Peres, 2015; Cesaroni & Consoli, 2015) and this finding is authentic. Other organisations do not allow their employees to use social media because of potential risks and consequences of misuse (Gaal et al, 2015) but making use of social media will certainly promote knowledge sharing. At organisational level, we can therefore advise that CKOs identify the information to be shared and what is to be kept confidential. We can therefore conclude that social media has exposed Knowledge Management to a new dimension.

## **5.8 Summary**

The chapter discussed the findings with reference to the research questions outlined already. The findings revealed that organisational transformation is dependent on KM. Organisational transformation is defined by Sharma (2012) as a planned change where organisations restructure themselves objectively to survive in a competitive environment. KM may certainly improve organisational performance. Management should embrace KM activities to enhance successful organisational transformation. The transformation process occurs in response to changes in context, technology, organisational structure and organisational culture. Adopting KM strategies and practices can further strengthen organisational performance. This chapter has led to the realisation of the research objectives which sought to explore the initiatives to facilitate knowledge sharing, identify barriers to effective KM and analyse the role of social media for KM. Other objectives sought to measure the effectiveness of the knowledge transfer activities. This chapter provided answers to the main research question. The next chapter therefore presents the conclusions and recommendations drawn from the findings.

## **CHAPTER SIX– CONCLUSION AND RECOMMENDATIONS**

### **6.1 Introduction**

This chapter presents a comprehensive summary of the study. The research questions and objectives have been clearly stated in Chapter 1. Theoretical frameworks and experimental studies on KM were discussed in Chapter 2. The data collection and analysis methods were discussed in Chapter 3, together with the reasons for adopting the quantitative methods of research. The properties of validity and reliability of research were also discussed in the 3<sup>rd</sup> chapter. The practical findings of the investigation have been presented and discussed in Chapter 4 and Chapter 5 respectively. This chapter includes a summary of the research findings and recommendations for future research. The limitations of the study are also highlighted. The chapter ends with the researcher's personal reflections.

### **6.2 Summary of findings**

The research findings were analysed and presented in detail in Chapter 4. Chapter 5 discussed these findings with reference to the research questions and the study objectives outlined already. The questionnaire instrument was used to validate the quantitative findings whilst the interviews were used to qualitatively supplement the quantitative findings. The findings have demonstrated that organisational transformation is dependent on effective KM (Mosconi & Roy, 2013). Every organisation should define KM in its own context and should make use of the correct tools for effective KM. Knowledge Management is an independent variable and organisational transformation is a dependent variable. Therefore organisational transformation depends on effective Knowledge Management. This section presents an overview of the findings stemming from the analysis and presentation of the research results in Chapter 4 of this research report. The empirical findings emanating from the research investigation are presented in line with each of the research questions and objectives as explained in the following sections.

#### **6.2.1 Findings on KM fundamentals**

The researcher was interested in determining the KM awareness of the participants. According to the quantitative data collected using a questionnaire, it was found that 70% of the participants were aware of KM whilst the other 30% were not aware. It has been revealed also in literature that organisational members who are aware of KM will certainly promote and re-use knowledge (Girard & Girard, 2015). Those members who are not aware of KM should be encouraged to participate into such KM practices and processes so as to boost organisational productivity. The researcher also found during the interviews with HODs that the participants were aware of KM and they participated and practiced KM though in their organisations it was not labelled as Knowledge Management.

### **6.2.2 Findings on the meaning of KM in knowledge-intensive organisations**

According to the literature review, every organisation defines KM in its own context (Siegel & Shim, 2010; Girard & Girard, 2015; Liu, 2016). The KM statements analysed using descriptive statistics demonstrated that KM is a practice which facilitates fast and better decision making as represented 71% of the participants who strongly agreed and agreed with the construct. Moreover, decision making has the ability to enhance collective understanding. It therefore becomes evident that effective teams will make fast and better decisions in the organisations studied. Better decision-making generates more alternatives from combined wisdom of the effective teams.

We can further generalise that KM creates competitive advantage for organisations where 87% of the participants strongly agreed and agreed with the construct. This certainly meant that for organisations to be competitive, the KM practices should be practised. KM helps in continuous transformation of individual learning to organisational learning as indicated by the participants' responses. Participants further confirmed that KM minimises loss of corporate memory, which is a fundamental aspect of KM. We can finally conclude that KM is an organisational practice which requires executive support as revealed by individual responses of 87% strongly agreeing and agreeing that all KM efforts in organisations require management support.

### **6.2.3 Findings on initiatives to enable knowledge sharing**

In line with the view that knowledge sharing is very important (Wang & Noe, 2010), and arising from the research data, the researcher was able to explore the initiatives which could enable knowledge sharing in organisations. According to the responses from the participants, executive support was one of the major initiatives for knowledge sharing. Other initiatives were centred on promoting a knowledge sharing culture. Most of the responses received from the interviewees included offering and funding of KM courses and workshops. In an effort to improve organisational performance, organisations should offer and fund KM courses and also allow time to attend KM workshops.

Other initiatives for knowledge sharing mentioned by interviewees during interviews included socialising through CoP as also described by Wenger (2010). Since the main objective of knowledge sharing is to transfer knowledge across organisational units (Saenz, Aramburu & Blanco, 2012), some interviewees proposed creation of supportive environments as well as identification of both internal and external best practices from which knowledge can be obtained and shared.

#### **6.2.4 Findings on motivational factors for experts to share knowledge**

Based on the descriptive statistics presented in Chapter 4, motivational factors to share knowledge were found to be very important in organisations. It has been revealed that 51.8% of the participants considered rewards as an important motivational factor to share knowledge as shown on Table 4.12 on page 110. Recognition, bonuses and promotion were also considered important motivational factors in organisations. Motivation is therefore very important for experts to share their knowledge as supported by Stenius et al (2016) who revealed that experts in different fields should be motivated in some way to share what they know with others.

These forms of motivation may differ from one organisation to another, depending on the organisational structures and processes in place. Most of the interviewees also stated that they prefer being rewarded in monetary terms for their sharing efforts. Studies by Todorova & Mills (2014) on the impact of rewards on knowledge sharing proved that monetary rewards do not have a significant effect. Thus, other forms of motivation should be taken into consideration in an effort to increase organisational performance and eventually transform it.

#### **6.2.5 Findings on the barriers that impact on effective KM**

Barriers have been defined by Ujwary-Gil (2011) as elements that negatively affect the realisation of KM in organisations. In this study, it has been clearly revealed that lack of budget to support KM efforts is the greatest barrier to effective KM as evident in the data collected with a 67.9% of the participants. Lack of executive support was the second barrier with 57.1% of the participants. Lack of time, motivation and rewards recorded 52.7%. All the other barriers recorded less than 50% of the participants. The data is presented on Table 4.13 on page 113 of this report. From this observation we can see that lack of finance is the biggest barrier to effective KM, followed by lack of executive support and then lack of time, motivation and rewards.

Overcoming these barriers by having sufficient finances for KM projects, having management support and motivating employees will certainly transform organisations. From the previous studies by Singh & Kant (2008), lack of management support was found to be a critical barrier to effective KM. Organisations should therefore avail sufficient funds for effective Knowledge Management.

### **6.2.6 Findings on the tools and technologies to support KM**

The tools to support KM are either IT-based or non-IT based. From the data collected, analysed and presented in Table 4.14 on page 119, the best IT tool to support KM is a collaborative virtual workspace which meets expectations by 80.3%. On the other hand, the best non-IT tool to support KM is a CoP which meets expectations by 61.6%. All the other tools like brainstorming, collaborative virtual workspaces and storytelling are also important for transferring knowledge. Making use of such tools and technologies in organisations will eventually change those organisations.

Combining IT and non-IT tools in KM will certainly improve knowledge sharing and other knowledge transfer processes. Since it has been revealed that the best IT tool is a collaborative virtual workspace and the best non-IT tool is a CoP, these two tools can be combined to come up with a robust knowledge transfer tool which we can call a Collaborative Virtual Community of Practice. The size of such a virtual CoP may range from 2 - 3 people to hundreds and thousands as Wenger (2010); Jang & Ko (2014) and McDonald (2016) says.

### **6.2.7 Findings on the role of social media for effective KM**

Social media enables knowledge sharing on various platforms bringing everyone together in virtual reality. Of all the available social media, LinkedIn was considered by the participants as the best platform for knowledge sharing with 54.5% representation. This was followed by Skype with 24.1% of the participants as evident on the data in Table 4.15 on page 130. The main role of social media for KM was found to be the provision of platforms to share knowledge (Shah & Khan, 2013). These platforms allow people to contribute to a number of concerns associated with communication, knowledge sharing and collaboration.

Additionally, social media allows individuals to generate new possibilities which accelerate innovation and boost productivity. Accelerating innovation, technological advances and boosting productivity are the key drivers for KM which may ultimately transform organisations. Equally important, junior employees will easily acquire tacit knowledge through social media and senior employees will get recognition of their knowledge bases. More so, senior staff will continually upgrade their knowledge with new developments, thus promotion of a knowledge sharing culture, a point which Hassam & Al-Hakim (2012) emphasise.

### 6.2.8 Findings on the effectiveness of knowledge transfer activities

Knowledge transfer activities are essential in organisations so as to realise the KM goals. The usefulness of knowledge transfer activities is essential so that the best activities can be selected and embedded in the organisational structures and processes (Rasula et al, 2012). KM should result in complete organisational transformation which involves redesigning and redefining business processes. According to the data collected and analysed, the most effective knowledge transfer activity is a CoP which was classified by the participants as very effective by 27%. This was followed by job rotation which was also ranked very effective by 18% of the participants. Storytelling and mentoring were also ranked as very effective knowledge transfer activities as shown on Table 4.20 on page 141.

An organisation which is transformed has best practices, shares knowledge among co-workers and it makes use of the best tools and technologies for its operations. Furthermore, a transformed organisation has a sharing culture embedded into the organisational structures and processes. It is worth noting that people are key agents for successful organisational transformation and these people are assisted by Information Technologies to transfer and share knowledge.

## 6. 3 Recommendations

Based on the findings and from a management perspective, the study recommends the following, for effective organisational transformation in knowledge-intensive organisations through improved knowledge sharing and transfer:

**Recommendation 1:** Offer and fund KM courses and related workshops to increase employee expertise and knowledge of specific mechanisms and tools that can be applied to improve and support knowledge-sharing and knowledge-transfer activities in organisations.

**Recommendation 2:** Provide sufficient financial resources to support the deployment of suitable tools and technologies that facilitate knowledge sharing and knowledge transfer.

**Recommendation 3:** Deploy motivational mechanisms such as bonuses and rewards to motivate employees to share and transfer more of their expertise within organisational teams or between organisational teams.

**Recommendation 4:** Facilitate the design of a combination of IT and non-IT based tools (such as wiki's, blogs Virtual CoPs and Discussion forums) to enable knowledge transfer between experts and novices within organisational teams and between teams across affiliates.

**Recommendation 5:** Mobilize leaders or CKO's to design a suitable knowledge sharing and transfer strategy and accompanying platforms to protect confidential knowledge and organisational Intellectual Property from loss and or leakage.

**Recommendation 6:** Appoint knowledge champions responsible for the creation of CoPs that promotes the sharing of practice-related knowledge sharing and transfer.

#### **6.4 Limitations of the study**

There were various limitations that militated against the smooth operationalization of the study. A total of 130 questionnaires were distributed to the participants and some of them were not returned to the researcher. Out of the 119 questionnaires which were completed and returned by the participants, seven (7) of them were partially completed and were discarded by the researcher. This reduced the number of questionnaires to 112 which were used for the data analysis, limiting broader generalisations of the findings. The response rate was 86.1%. Only eleven (11) interviews were conducted with HODs and managers due to limited time and financial resources. The results of this study could be generalised to knowledge-intensive organisations in Namibia only. The sample size was not very big due to limited number of participants who could provide the researcher with satisfactory responses.

#### **6.5 Suggestions for future research**

This study was a success in that all the objectives of the research project were met. Recommendations for promoting knowledge sharing and knowledge transfer in Namibia have been provided. KM has been practiced in the knowledge-intensive organisations without a clear understanding of the practices and processes involved. Further research should explore how to use technology to search for new knowledge and the researcher proposes the following topic.

**Topic:** Using technology to search for knowledge in organisations.

## 6.6 Personal reflections

As a novice researcher I found the research process quite interesting and it was a real learning experience. With the advent of digital technologies, I was able to interact with experienced researchers across the world in the field of KM. I managed to collaborate with many KM practitioners using some of the tools discussed in this study. UNISA library presentations empowered me with some resources which helped me to make this research possible. My study supervisor, Professor Sheryl B. Buckley, encouraged me to write a paper and this made me realise that as a researcher one must accept criticism as a foundation for successful research. The paper entitled “**Knowledge Management: Understanding its Benefits, Processes, Infrastructure and Barriers.**” has been submitted to the *African Journal of Science, Technology, Innovation and Development (AJSTID)*. The research paper has been peer-reviewed by reviewers and is pending publication in the journal. Another journal article entitled “**Storytelling as a knowledge transfer tool**” has been submitted to the *African Journal of Indigenous Knowledge Systems (AJIKS)* and is currently under review.

## 6.7 Summary

The findings and recommendations from this study were discussed. The chapter also proposed possibilities of future research in KM using appropriate technologies. The study established that there is a relationship between Information Technology and Knowledge Management. The initiatives to enable knowledge sharing have been explored. Barriers to effective KM and the subsequent solutions were also outlined. Most effective knowledge transfer activities were analysed and discussed in detail. It was also revealed that organisational transformation is dependent on effective KM, where people are key agents for successful transformation. Initiatives and motivational factors were found to be major mechanisms that can be introduced to enable and facilitate knowledge sharing and transfer.



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## APPENDICES

### APPENDIX 1: PARTICIPANT INFORMATION SHEET

07 March 2017

#### Dear Prospective Participant

My name is Alfred Hove Mazorodze. I am carrying out a research for my Master's studies at the University of South Africa under the supervision of Prof SB Buckley a professor in the School of Computing. My topic is "**Knowledge Management and its effectiveness for organisational transformation**" and we are inviting you to participate in this study.

The purpose of this study is to obtain knowledge from workers and knowledge creators on the enablers and barriers to effective Knowledge Management in organisations. Moreover, the study is being undertaken to encourage and promote a knowledge sharing culture in Namibia. Most institutions in Namibia do not teach and participate in Knowledge Management, as evident in the curriculum specifications and searches undertaken, thus there is need to research and promote the discipline. Some institutions practice Knowledge Management activities without a full understanding of the processes involved. The study should therefore, in anticipation, lead to policy formulation and adoption of integrated Knowledge Management practices in Namibia and beyond.

You have been selected to take part in this research through purposive sampling, which is based on the researcher's judgement as to who can provide the best solutions to the research questions asked. I therefore look forward to your support and cooperation in this regard. Please, note that your views in this interview session and questionnaire shall not, in any way be used for any other purpose other than what has been stated above. You are therefore assured that your views shall not be used in a way that might cause damage to your reputation as an individual or otherwise, integrity, emotions, or indeed professional conduct as the information provided will be treated confidentially.

Please answer the questionnaire as honestly and comprehensively as you can. There is no right or wrong answer to these questions; we are interested in your insights and opinions. The questionnaire requires approximately 30 minutes of your time. There are no risks nor discomfort associated with your participation and there are not any direct benefits for your participation. No compensation is provided to anyone participating in this research. However, we do value your time and input towards improving the understanding of Knowledge Management and its usefulness in organisations.

The researcher will be taking notes of the interview but your identity will not be divulged in any way. The input you provide shall be treated confidentially and only used towards the completion of the afore-mentioned research. All responses will be analysed collectively and therefore individual answers will not be linked to any names and positions of participants. Data will be presented in summary form without reference to an individual. Participation in this research study is voluntary, and you have the right to, at any time, withdraw or refuse to participate.

If you would like to be informed of the final research findings, please contact Alfred Hove Mazorodze on +264-81-2950087. Should you require any further information or want to contact the researcher about any aspect of this study please contact the researcher on [mazorodzeah@yahoo.com](mailto:mazorodzeah@yahoo.com). Should you have concerns about the way in which the research has been conducted, you may contact [sherbuck@gmail.com](mailto:sherbuck@gmail.com). Contact the research ethics chairperson of the School of Computing on [socethics@unisa.ac.za](mailto:socethics@unisa.ac.za) if you have any ethical concerns.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.



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Alfred Hove Mazorodze

## APPENDIX 2: QUESTIONNAIRE

### SECTION A: BIOGRAPHICAL INFORMATION

Please select the applicable by placing an **X** in the box next to it.

1. What is your gender?

Gender	X
a) Male	
b) Female	

2. How old are you?

Age	X
a) Less than 25 years	
b) 25 – 30 years	
c) 31 – 40 years	
d) 41 – 50 years	
e) 51 – 60 years	
f) Above 60 years	

3. What is your highest level of education?

Qualifications	X
a) Certificate / Diploma	
b) Bachelor's degree	
b) Honours' degree	
c) Master's degree	
d) Doctoral degree	
e) Other	

4. How long have you been working?

Working Experience	X
a) Less than one year	
b) 1 - 3 years	
c) Between 4 and 10 years	
d) More than 10 years	

5. What type of institution are you involved in?

Type of institution	X
a) Tertiary education	
b) Consulting engineering	
c) Corporate training	
d) Other	

6. Please indicate in which region your institution is situated.

Province	X			X
a) Erongo			h) Ohangwena	
b) Hardap			i) Omaheke	
c) Karas			j) Omusati	
d) Kavango East			k) Oshana	
e) Kavango West			l) Oshikoto	
f) Khomas			m) Otjozondjupa	
g) Kunene			n) Zambezi	



## SECTION B: KNOWLEDGE MANAGEMENT FUNDAMENTALS

### Definitions & instructions

Knowledge Management (KM) is defined by Nonaka & Takeuchi (1995) as a process of capturing, developing, sharing, and effectively using organisational knowledge. According to Davenport (1998), KM is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. Bercerra-Fernandez & Sabherwal (2010) concurs with Davenport's view and offer that KM entails carrying out activities involved in discovering, capturing, sharing and applying knowledge in terms of resources and people skills, so as to improve the impact of knowledge on the unit's goal realisation. We can therefore conclude that KM is a strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organisational performance. In this section you are required to indicate your awareness of KM

7. Were you aware of what KM entails before this introduction? Mark with an **X** in the appropriate box.

**Yes**

☐

**No**

☐

8. Which of the following activities are you involved in? Choose more than one if necessary.

Activity	X
Teaching	
Research	
Curriculum development	
Consultancy	
Project Management	
Other(please specify)	

9. By the time you joined this institution, did you already have experience in any of the following functions?

Activity	Yes	No
Teaching		
Research		
Curriculum development		
Consultancy		
Project Management		
Other (please specify)		

- 10.** Which of the following knowledge transfer activities exist in your department/institution?  
Choose more than one if necessary by putting an **X** in the appropriate box.

Knowledge transfer activity	X
Communities of Practice	
Mentoring	
Coaching	
Succession planning	
Knowledge repositories	
Storytelling	
Job rotation	
Orientation	
Other (specify)	

- 11.** Which of the following knowledge transfer activities have you used in your department?  
Choose more than one if necessary by putting an **X** in the appropriate box.

Knowledge transfer activity used	Yes	No
Communities of Practice		
Mentoring		
Coaching		
Succession planning		
Knowledge repositories		
Storytelling		
Job rotation		
Orientation		
Other (specify)		

## SECTION C: KNOWLEDGE MANAGEMENT CONSTRUCTS IN ORGANISATIONS

The following statements reveal some characteristics or features of KM in an organisational context according to the literature review conducted by the researcher. What is your opinion on each of the constructs offered here? Mark with an **X**.

12. KM facilitates fast and better decision-making in an organisation.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

13. KM enhances productivity and quality of service.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

14. Implementing KM results in sharing 'best practices.'

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

15. KM increases innovation by the employees.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

16. KM increases the learning capabilities of employees.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

17. KM creates competitive advantage for institutions.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

18. KM assists in better staff attraction and also retention.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

19. KM results in improved collaboration within the organisation.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

20. KM addresses the communication gap in the organisation.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

21. KM helps in continuous transformation of individual learning to organisational learning.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

22. KM stimulates cultural change among employees.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

23. KM improves team effectiveness and delivery of outcomes.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

24. KM creates an organisational culture devoted to continuous process improvement.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

25. KM is supported by Information & Communication Technologies.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

26. KM facilitates smooth transition from those retiring to their successors who are recruited to fill their position.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

27. KM minimizes loss of corporate memory as knowledge is represented in documents and databases.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

28. KM avoids repetition of tasks by promoting knowledge re-use.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

29. All KM efforts require executive support.

Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

## SECTION D: CHALLENGES OF ICTs FOR KM

ICTs play a vital role in KM activities such as knowledge capture, sharing, transfer and storage. With the emergence of various technologies, institutions aim to maintain a competitive edge by fully utilising ICTs to their advantage. ICTs facilitate and support various KM activities by providing an enabling environment and they can be used commendably to capture and share knowledge. The challenge lies on how the institutions can utilise ICTs to capture, retain and share knowledge?

30. What is your level of computer literacy?

Excellent

☐

Very Good

☐

Good

☐

Fair

☐

Poor

☐

31. Describe your competence level of the following technologies? Mark with an X in the appropriate box.

Device	Never used	Novice	Competent	Expert
a) Mobile (Cellphone)				
b) Tablet computer (e.g. iPad)				
c) Laptop				
d) Electronic mail (E-mail)				
e) Wiki's				
f) Knowledge bases				
g) Blogs				
h) Discussion Forums				

- 32.** What ICT infrastructure is available in your institution for knowledge capturing and sharing? Choose all that apply.

ICT Infrastructure available	X
Internet	
E-mail	
Cellphone	
Telephone	
Best practices database	
Knowledge repositories	
Virtual conferences	
Electronic bulletins	
Discussion forums	
Groupware	
Wikis	
Skype	
Libraries	
Intelligent search engines	

- 33.** Do you have access to the various ICTs for knowledge transfer and sharing? Choose all that apply from the boxes below and mark with an **X**.

ICT infrastructure access	Yes	No
Internet		
E-mail		
Cellphone		
Telephone		
Discussion forums		
Best practices databases		
Computers		
Knowledge repositories		
Virtual conferences		
Libraries		
Intelligent search engines		
Groupware		
Electronic bulletins		
Skype		
Wiki's		

- 34.** Do you think you need training on the use of any of the following ICT tools for knowledge management? If so, mark with an **X** in the appropriate box. Select all that apply.

ICT tool	Yes	No
Internet		
E-mail		
Cellphone		
Telephone		
Discussion forums		
Best practices databases		
Computers		
Knowledge repositories		
Virtual conferences		
Libraries		
Intelligent search engines		
Groupware		
Electronic bulletins		
Skype		
Wiki's		

- 35.** What challenges do you face with regard to the use of ICTs for KM? Explain to the best of your ability.

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## SECTION E: INITIATIVES TO ENABLE KNOWLEDGE SHARING

Creating a 'knowledge sharing culture' is considered one of the most important knowledge sharing initiatives in an organisation. Other initiatives for knowledge sharing include training and succession planning. All these knowledge sharing initiatives require executive support. Indicate whether you agree with the following statements or not with regard to knowledge sharing initiatives in your organisation.

36. My institution's management supports KM activities.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

37. My institution supports and promotes a knowledge sharing culture.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

38. My institution has the necessary technology to support KM.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

39. My institution currently offers KM courses and workshops.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

40. My institution allows *time* to attend KM courses and workshops.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

41. My institution provides funding to attend KM courses.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

42. I have attended a session of KM activities such as coaching and mentoring.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

43. KM experience is a pre-requisite when recruiting staff at my institution.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

44. My institution has a succession plan.

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

## SECTION F: MOTIVATIONAL FACTORS FOR SHARING KNOWLEDGE

Experts in different fields should be motivated to share what they know with others.

45. Which of the following motivational factor do you consider best for you to share your expert knowledge with others?

Motivation factor	X
Rewards	
Recognition	
Promotion	
Bonuses	
Pay-for-performance plan	
Other (specify)	

46. Briefly explain other motivational factors which you feel are important for you to share your valuable knowledge in your institution.

.....

.....

## SECTION G: BARRIERS TO EFFECTIVE KM

Barriers negatively affect the realisation of KM in organisations. These barriers can be organisational, technological or individual. Contemporary studies attempt to find ways to overcome these barriers and improve organisational performance.

47. Which of the following barriers greatly affect the implementation of KM in your institution? Mark all that apply with an X. Choose more than one if necessary.

Barrier	X
Lack of executive support	
Lack of budget to support Knowledge Management efforts	
Resistance to change	
Prohibitive organisational structure	
Lack of time, motivation & rewards	
Inefficient communication and lack of training	
Lack of knowledge sharing culture & cultural differences among staff	
Lack of technological infrastructure	
Lack of trust	
Differences in levels of education	
Lack of clear return on investment	
Lack of appropriate methodologies	
Other (specify)	

48. Suggest any ways of overcoming the barriers you have selected above.

.....

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.....



## SECTION H: TOOLS AND TECHNOLOGIES FOR KM

Knowledge Management (KM) tools are either IT-based or non-IT based.

IT tools are: Knowledge bases, Blogs, Social networks, Document libraries and collaborative workspaces.

Non-IT tools are: Brainstorming, Storytelling, Communities of Practice, Collaborative physical workspaces and learning reviews.

**49.** How well do these tools and technologies meet your needs for knowledge sharing in your organisation? Please select the most appropriate by placing an **X** in the chosen box.

Consider the following categories:

- 1...Below expectations
- 2...Needs improvement
- 3...Neutral
- 4...Meets expectations
- 5...Exceeds expectations

Knowledge Management tool	1	2	3	4	5
a) Knowledge bases					
b) Blogs					
c) Social networks					
d) Document libraries					
e) Collaborative virtual workspaces					
f) Brainstorming					
g) Storytelling					
h) Communities of Practice					
i) Collaborative physical workspaces					
j) Learning reviews					

**50.** State your other expert comments with regard to KM tools:

.....

.....

.....

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.....

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## SECTION I: THE ROLE OF SOCIAL MEDIA FOR KNOWLEDGE MANAGEMENT

Social media tools involve Facebook, Twitter, LinkedIn, Myspace and many other platforms. These tools can be used to facilitate KM activities and improve the knowledge management systems in place.

51. Which one of the following social media do you consider best for knowledge sharing in your organisation? Choose one only.

Social network	X
Facebook	
Skype	
Twitter	
LinkedIn	
Myspace	

52. Please rank the following statements about the role of social media for KM by placing an X in the appropriate box.

Consider the following categories:

1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5= Strongly Agree.

Statement	1	2	3	4	5
a) Social media facilitates generation of new knowledge					
b) Junior employees will easily acquire tacit knowledge					
c) Senior employees will get recognition of their knowledge base					
d) Senior staff will continually upgrade their knowledge with new developments					
e) Social media promotes a knowledge sharing culture					

State your other comments about social media for knowledge sharing

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## SECTION J: RELATIONSHIP BETWEEN IT AND KM

IT is considered as a catalyst and critical motivator for effective and efficient KM in modern organisations. ITs provide platforms for knowledge capture, sharing and storage.

**53.** Do you agree or disagree with the following statements? Answer either **Yes / No**. Mark with an **X**

### Relationship between IT and KM

Statements on IT	Yes	No
a) IT facilitates knowledge transfer through e-learning and blended learning		
b) IT provides a platform for communication and cooperation, message exchange and collaborative work		
c) IT facilitates knowledge integration including data evaluation, analysis and aggregation		
d) IT improves knowledge search using search engines		
e) IT enables knowledge presentation using different tools		
f) IT assists administrative functions of reporting and management		
g) IT provides publication, structuring and linking tools		
h) IT facilitates knowledge sharing in organisations		

### Relationship between KM and IT

Statements on KM	Yes	No
i) Successful KM in organisations require good ICT infrastructure		
j) Creating a “knowledge sharing culture” in an organisation can be enabled by social media, which is an IT tool		
k) KM facilitates knowledge acquisition and sharing of ideas through knowledge repositories		
l) Most modern Communities of Practice are now Information Technology based		
m) Team collaboration, groupware and sharing of information on best practices databases is enabled by ICTs.		
n) KM approaches make use of communication and information sharing tools		
o) KM is implemented using ICT tools like knowledge portals which are web-based		
p) KM can be strengthened by Web 2.0 tools like Dropbox, Google Docs and Wikis		

## SECTION K: MEASURING THE EFFECTIVENESS OF KNOWLEDGE TRANSFER ACTIVITIES

Measures used to monitor the effectiveness and responsiveness of a chosen technology are call “system metrics”. Metrics are developed for continuous process improvement of KM undertakings and should be compared to a benchmark.

**54.** Which of the following knowledge transfer activities do you consider effective for enabling flow of knowledge in your organisation? Mark with an **X** for each activity.

Knowledge transfer activity	Very Effective	Effective	No Opinion	Somewhat effective	Not effective
a) Communities of Practice					
b) Succession planning					
c) Coaching					
d) Storytelling					
e) Knowledge repositories					
f) Mentorship					
g) Job rotation					
h) Keenness to share knowledge					
i) Adaptability to organisational culture					
j) Other (Specify)					

### APPENDIX 3: INTERVIEW GUIDE

TOPIC: KNOWLEDGE MANAGEMENT AND ITS EFFECTIVENESS FOR ORGANISATIONAL TRANSFORMATION

Date of interview :.....

Place of interview :.....

Gender of interviewee :.....

#### SECTION A: BACKGROUND QUESTIONS & KM FUNDAMENTALS

1. What is your current position?.....

2. How long have you been working in the current institution and position?.....

3. What are the main responsibilities of your position?.....

.....

4. Have you ever heard of KM?.....

5. In brief, what does it involve?.....

.....

6. From your understanding, do you think KM is important in this organisation? If so, why?

.....

7. Personally, do you like sharing information and knowledge with your colleagues?

.....

#### SECTION B: CHALLENGES OF ICTs FOR KM

10. What are the main challenges you face with regard to ICTs for KM?

.....

## SECTION C: INITIATIVES & MOTIVATIONAL FACTORS FOR KNOWLEDGE SHARING

11. What initiatives do you think should be put in place to allow knowledge sharing in your organisation?.....

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12. How do you want to be rewarded if you are to share your expert knowledge with your juniors? .....

.....

## SECTION D: BARRIERS AFFECTING KM IMPLEMENTATION

13. Can you explain to me the barriers which affect the implementation of KM in this organisation? .....

.....

.....

14. How can the barriers you have just explained be overcome? .....

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15. Do you have a budget for KM?

.....

## SECTION E: TOOLS AND TECHNOLOGIES FOR KM

16. Tools for KM include knowledge bases, blogs, social networks, brainstorming, storytelling and CoP. Which of these do you think is the best tool for knowledge sharing and why do you say so?

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17. As an individual, do you consider IT tools better than non-IT tools for knowledge sharing? .....

.....

## SECTION F: SOCIAL MEDIA FOR KM

18. Which social media do you use for sharing information?

.....

19. Do you see the social media platform you use as important for knowledge sharing?

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.....

.....

## SECTION G: IT & KM

20. How often do you use IT for KM?

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## SECTION H: EFFECTIVENESS OF KNOWLEDGE TRANSFER ACTIVITIES

21. For KM to be effective in your organisation, what activities do you think should be taken into consideration?

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## APPENDIX 4: ETHICAL CLEARANCE CERTIFICATE



### UNISA COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY'S (CSET) RESEARCH AND ETHICS COMMITTEE

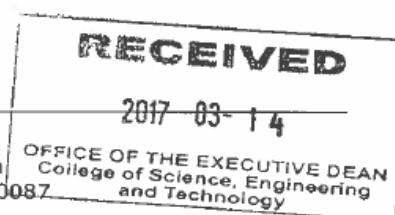
13 March 2017

Ref #: 009/AHM/2017/CSET\_SOC  
Name: Alfred Hove Mazorodze  
Student #: 44156057

Dear Mr. Alfred Hove Mazorodze

**Decision: Ethics approval for three years  
(Humans involved)**

**Researcher:** Alfred Hove Mazorodze  
P.O. Box 2931, Oshakati, Republic of Namibia  
44156057@mylife.unisa.ac.za, +264-81-2950087



**Supervisor (s):** Prof S.B. Buckley  
sherbuck@gmail.com, +27 82 57 4757

**Proposal: Knowledge Management and its effectiveness for organisational transformation**

**Qualification:** MSc in Computing

Thank you for the application for research ethics clearance by the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee for the above mentioned research. Ethics approval is granted for a period of three years from 13 March 2017 to 13 March 2020.

1. The researcher will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Unisa College of Science, Engineering and



University of South Africa  
Pretorius Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
www.unisa.ac.za



Technology's (CSET) Research and Ethics Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

3. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.
4. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.

Add any other conditions if relevant.

**Note:**

*The reference number 009/AHM/2017/CSET\_SOC should be clearly indicated on all forms of communication with the intended research participants, as well as with the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee*

Yours sincerely

*Adde da Veiga*

Dr. A Da Veiga

Chair: Ethics Sub-Committee School of Computing, CSET

*[Signature]*

Prof I. Osunmakinde

Director: School of Computing, CSET

*BB Mamba*

Prof B. Mamba

Executive Dean: College of Science, Engineering and Technology (CSET)

Approved - decision template – updated Aug 2016

University of South Africa  
Preller Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
[www.unisa.ac.za](http://www.unisa.ac.za)

## APPENDIX 5: APPROVAL LETTER FROM THE UNIVERSITY OF NAMIBIA.



(+264) 61 206 3111  
Website: [www.unam.na](http://www.unam.na)



340 Mandume Ndemufayo Avenue  
Private Bag 13301  
Windhoek  
Namibia

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Inspiring minds, shaping the future

---

31 March 2017

Mr Alfred Hove Mazorodze  
P.O. Box 2931  
Oshakati  
Namibia

Dear Mr Mazorodze

**RE: PERMISSION TO CONDUCT RESEARCH**

Reference is made to your letter dated 7 February 2017, regarding the subject matter. I am pleased to inform you that permission has been granted to conduct research in the area of your interest at UNAM campuses in the north, on the understanding that participation by the staff members in the envisaged research is voluntary. Further, no formal proceedings should be interrupted by the exercise.

We wish you all the best in this endeavour and would appreciate a copy of the findings for our library.

Yours truly,

**Dr Helena Miranda**  
Deputy Director: Academic Affairs & Research  
Hifikepunye Pohamba Campus  
University of Namibia  
Tel: +264 65 232 3042  
Fax: +264 (0) 65 230 006  
E-mail: [hmiranda@unam.na](mailto:hmiranda@unam.na)  
Web: <http://www.unam.edu.na>  
Private Bag X5507, Oshakati, NAMIBIA

**APPENDIX 6: APPROVAL LETTER FROM INTERNATIONAL UNIVERSITY OF MANAGEMENT (IUM)**



**THE INTERNATIONAL UNIVERSITY OF MANAGEMENT**  
Windhoek - Namibia

*Global hub for Management Science and Information Technology*

9<sup>th</sup> February 2017


**TO WHOM IT MAY CONCERN**

**REFERENCE AFRED HOVE MAZOROODZE**

As the Campus Director of the International University of Management Ongwediva Campus, hereby give permission to the bearer of this letter (**Mr Alfred Hove Mozorodze**) to conduct studies at our University for the sake of his Master Degree.

We are so happy to have him with us and trust the information he will get will be of useful to his study and to the body of knowledge.

Thank you.

  
**Simataa F. Mwiya**  
Campus Director



**WINDHOEK CAMPUS**

Head Office  
59 Bahnhof Str  
Private Bag 14005, Bachbrecht  
Tel: 061-245150/84  
Fax: 061-245112  
E-Mail: ium@ium.edu.na

**WALVIS BAY CAMPUS**

Social Security Building  
P.O. Box 346 Walvis Bay  
Tel: 064 - 206647  
Fax: 064 - 206647  
E-mail: adm.wbay@ium.edu.na

**SWAKOPMUND CAMPUS**

Haus Meeresruh Complex  
P.O. Box 3303 Vineta  
Tel: 064-400106  
Fax: 064-400106  
E-mail: adm.swk@ium.edu.na

Website: www.ium.edu.na

**ONGWEDIVA CAMPUS**

P.O. Box 2775, Oshakati, Tel: 065-230145/230149  
Fax: 065-230159  
E-mail: adm.ong@ium.edu.na

## APPENDIX 7: APPROVAL LETTER FROM CONSULTING SERVICES AFRICA



**CONSULTING  
SERVICES  
AFRICA**

Makalani Real Estate Complex  
ONGWEDIVA  
P O Box 1620  
OSHAKATI Namibia  
Tel.: +264(0)65 230 316  
Fax: +264(0)65 230 317  
Cell: +264(0)81 124 9493  
E-mail: csa@mweb.com.na  
Website: www.csa-nam.com

MULTI-DISCIPLINARY CONSULTING ENGINEERS AND PROJECT MANAGERS

07 February 2017

**Our Ref:** N 9010AA

UNISA Student  
PO Box 2931  
**OSHAKATI**  
Namibia

Attention: Mr Alfred Hove Mazorodze

### **LETTER OF AUTHORIZATION TO CONDUCT RESEARCH AT CONSULTING SERVICES AFRICA**

This letter will serve as authorization for Mr Alfred Hove Mazorodze to conduct the research on Knowledge Management and its Effectiveness for Organisational Transformation. Upon review of the letter sent to us by Mr Alfred H. Mazorodze, we are glad to offer him an opportunity to conduct his research in our organisation.

Kindly be informed that Consulting Services Africa's professionals will be at hand to offer every possible contribution to the success of this program.

Thank you for your time and understanding.

Yours faithfully,

**EVAT N. KANDONGO**  
CONSULTING SERVICES AFRICA cc

Z:\confirmation\2017\let Alfred.doc

Company details on reverse



## APPENDIX 8: APPROVAL LETTER FROM CONSELECT CONSULTING ENGINEERS



**Conselect Engineering**  
Consulting Engineers & Project Managers  
Civil, Structural, Electrical & Mechanical

**ONGWEDIVA OFFICE**  
3265 Dr. Libesina Amathila Street  
Tel: +264 65 230 140  
Fax: +261 65 232 145

**WINDHOEK OFFICE**  
2nd Floor IFN Properties Building  
26 Maxwell Street  
Tel: +264 61 309 035  
Fax: +261 61 309 036

**RUNDU OFFICE**  
Erf 1190, Unit C, Tutungeni  
Tel: +264 66 255 363  
Fax: +261 66 256 353

**WALVIS BAY OFFICE**  
Cnr. Hage Geingob & 11th Road  
210 Swahili Building  
Tel: +264 64 200 195  
Fax: +261 64 200 196

Reg. No.: (PTY) Ltd. 2016/0375

P.O. Box 5076, Walvis Bay, Namibia

Tax. Reg. No.: 3472900-01-1

OUR REFERENCE: CEGEN/WM/cn/002

DATE: 06 February 2017

YOUR REFERENCE: .....

Mr. Alfred Hove Mazorodze  
P.O. Box 2931  
Oshakati  
Namibia,

**RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH ON KNOWLEDGE MANAGEMENT AND ITS EFFECTIVENESS FOR ORGANISATIONAL TRANSFORMATION**

Your letter dated 31 January 2017 requesting permission to conduct a research on Knowledge Management at our institution in Oshana region has reference.

Kindly be informed that the Consselect Consulting Engineers is in support of your research project as the outcome of your study may assist to devise the problem in question.

Kindly note that the organisation would appreciate it highly, if you could present it with a copy of your findings for our information.

Yours Sincerely



**CORBURN NYAMAPFENE**  
**For Consselect Engineering**



**Conselect Engineering**  
Consulting Engineers  
&  
Project Managers (pty) Ltd  
Reg. NO.: 2016/0375  
P.O. Box 184, Oshakati, Namibia  
T: +264 65 230 140 F: +264 65 232 145  
Cell: +264 81 146 4937  
VAT Reg. No.: 3472900-01-1

Directors:

(1) Wiseman Molatzi, Reg. Eng: BTEch. Elec. Eng: PSG: MDP: MEPA



## APPENDIX 9: APPROVAL LETTER FROM ONGWEDIVA CONSULTING ENGINEERS



**Consulting Civil/Structural Engineers**  
Ongwediva Office: Erf 3265, Libertine Amathila Street,  
Ongwediva. Phone: +264 65 230771. Fax: +264 65 230772.  
Fax-2-E-mail: +264 886 25497.  
Windhoek Office: 4 Adler Street, Windhoek West,  
Windhoek. P.O. Box 3769, Windhoek. Phone: +264 61 272122.  
Fax: +264 61 272120. E-mail: [ocenamibia@gmail.com](mailto:ocenamibia@gmail.com)  
Website: [ocenamibia.com.na](http://ocenamibia.com.na)

07 February 2017

Mr. AH Mazorodze  
Alf Technologies  
P.O. Box 2931  
Oshakati

### PERMISSION TO CONDUCT RESEARCH ON KNOWLEDGE MANAGEMENT

Dear Sir,

I would like to thank you for selecting our organisation for your academic research. After going through your letter of request, I am pleased to inform you that we are willing to participate in your study and assist you in your data gathering activities.

However, you should make an appointment through our office administrator as to when you will come for the interviews and focus group discussions as you stated in your letter. I would prefer that your meetings be done on Fridays afternoon as most of our staff members will be busy in the field during the weekdays.

We would be grateful if we can have a copy of your research findings.

Yours faithfully

.....  
Wabomba Singoro  
Managing Director (Pr. Eng)

## APPENDIX 10:      CONSENT FORM

I, \_\_\_\_\_ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedures, potential benefits and anticipated inconveniences of participation.

I have read and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

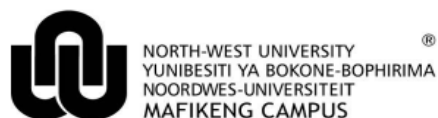
I agree to the collection and capturing of the data from the completed questionnaire.

Participant's signature.....Date.....

Researcher's name & surname.....

Researcher's signature.....Date.....

## APPENDIX 11: LANGUAGE EDITOR'S NOTE



Private Bag X2046, Mmabatho  
South Africa, 2735

Tel: +2718 389-2451  
Cell: 0729116600  
Web: <http://www.nwu.ac.za>

School of Teacher Education and Training  
Tel: +2718 389 2451  
Cell: 0729116600  
Email: [22055215@nwu.ac.za](mailto:22055215@nwu.ac.za)

10<sup>th</sup> May, 2017

TO WHOM IT MAY CONCERN

### CERTIFICATE OF EDITING

I, Muchativugwa Liberty, confirm and certify that I have read and edited the entire dissertation, **“KNOWLEDGE MANAGEMENT & ITS EFFECTIVENESS FOR ORGANISATIONAL TRANSFORMATION”** submitted in fulfilment of the degree of Master of Science in Computing at UNISA by **ALFRED HOVE MAZORODZE**.

I hold a PhD in English Language and Literature in English and am qualified to edit academic work of such nature for cohesion and coherence.

The views and research procedures detailed and expressed in the dissertation remain those of the researcher/s.

Yours sincerely



**Dr Muchativugwa L. (PhD [North-West University], MA [UZ], PGDE [UZ], PGCE [UZ], BA Honours, English [UZ])**

Original details: Dr Muchativugwa L. (22055215) C:\Users\22055215\Desktop\CERTIFICATE OF EDITING.docm

10<sup>th</sup> May, 2017

File reference: Dr Muchativugwa L.

starts here <sup>TM</sup>

